



6560-50-P

**ENVIRONMENTAL PROTECTION AGENCY**

**40 CFR Part 80**

**[EPA-HQ-OAR-2013-0479; FRL-9900-90-OAR]**

**RIN 2060-AR76**

**2014 Standards for the Renewable Fuel Standard Program**

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Proposed rule.

**SUMMARY:** Under section 211(o) of the Clean Air Act, the Environmental Protection Agency is required to set the renewable fuel percentage standards each November for the following year. Today's action proposes the annual percentage standards for cellulosic biofuel, biomass-based diesel, advanced biofuel, and renewable fuels that would apply to all motor vehicle gasoline and diesel produced or imported in the year 2014. For cellulosic biofuel, the statute specifies that EPA is to project the volume of production and must base the cellulosic biofuel standard on projected available volume if it is less than the applicable volume set forth in the Act. Today EPA is proposing a cellulosic biofuel volume for 2014 that is below the applicable volume specified in the Act. The statute also provides EPA the discretion to adjust the volumes of advanced biofuel and total renewable fuel under certain conditions. Relying on its Clean Air Act waiver authorities, EPA is proposing to adjust the applicable volumes of advanced biofuel and total renewable fuel to address projected availability of qualifying renewable fuels and limitations in the volume of ethanol that can be consumed in gasoline given practical constraints

on the supply of higher ethanol blends to the vehicles that can use them and other limits on ethanol blend levels in gasoline. These adjustments are intended to put the program on a manageable trajectory while supporting growth in renewable fuels over time. Finally, the statute requires EPA to determine the applicable volume of biomass-based diesel to be used in setting annual percentage standards under the renewable fuel standard program for years after 2012. EPA is proposing the applicable volume of biomass-based diesel that would apply in 2014 and 2015. EPA is requesting comment on a variety of alternative approaches and on a range of inputs and methodologies relevant for setting the applicable standards.

**DATES:** Comments must be received on or before **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

*Hearing:* We intend to hold a hearing. Details of the location and date will be provided in a separate notice.

**ADDRESSES:** Submit your comments, identified by

Docket ID No. EPA-HQ-OAR-2013-0479, by one of the following methods:

- [www.regulations.gov](http://www.regulations.gov): Follow the on-line instructions for submitting comments.
- Email: [a-and-r-docket@epa.gov](mailto:a-and-r-docket@epa.gov).
- Mail: Air and Radiation Docket and Information Center, Environmental Protection Agency, Mailcode: 2822T, 1200 Pennsylvania Ave., NW., Washington, DC 20460.
- Hand Delivery: EPA Docket Center, EPA West Building, Room 3334, 1301 Constitution Ave., NW., Washington, DC 20460. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

*Instructions:* Direct your comments to Docket ID No. EPA-HQ-OAR-2013-0479. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at [www.regulations.gov](http://www.regulations.gov), including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through [www.regulations.gov](http://www.regulations.gov) or e-mail. The [www.regulations.gov](http://www.regulations.gov) website is an “anonymous access” system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA without going through [www.regulations.gov](http://www.regulations.gov) your e-mail address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD-ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses. For additional information about EPA’s public docket visit the EPA Docket Center homepage at <http://www.epa.gov/epahome/dockets.htm>. For additional instructions on submitting comments, go to Section I.B of the **SUPPLEMENTARY INFORMATION** section of this document.

*Docket:* All documents in the docket are listed in the [www.regulations.gov](http://www.regulations.gov) index. Although listed in the index, some information is not publicly available, e.g., CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available

either electronically in [www.regulations.gov](http://www.regulations.gov) or in hard copy at the Air and Radiation Docket and Information Center, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave., NW, Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the Air Docket is (202) 566-1742.

**FOR FURTHER INFORMATION CONTACT:** Julia MacAllister, Office of Transportation and Air Quality, Assessment and Standards Division, Environmental Protection Agency, 2000 Traverwood Drive, Ann Arbor MI 48105; Telephone number: 734-214-4131; Fax number: 734-214-4816; E-mail address: [macallister.julia@epa.gov](mailto:macallister.julia@epa.gov), or the public information line for the Office of Transportation and Air Quality; telephone number (734) 214-4333; E-mail address [OTAQ@epa.gov](mailto:OTAQ@epa.gov).

**SUPPLEMENTARY INFORMATION:**

**I. General Information**

*A. Does this Action Apply to Me?*

Entities potentially affected by this proposed rule are those involved with the production, distribution, and sale of transportation fuels, including gasoline and diesel fuel or renewable fuels such as ethanol and biodiesel. Potentially regulated categories include:

Category	NAICS <sup>1</sup> Codes	SIC <sup>2</sup> Codes	Examples of Potentially Regulated Entities
Industry	324110	2911	Petroleum Refineries
Industry	325193	2869	Ethyl alcohol manufacturing
Industry	325199	2869	Other basic organic chemical manufacturing
Industry	424690	5169	Chemical and allied products merchant wholesalers
Industry	424710	5171	Petroleum bulk stations and terminals
Industry	424720	5172	Petroleum and petroleum products merchant wholesalers
Industry	454319	5989	Other fuel dealers

<sup>1</sup> North American Industry Classification System (NAICS)

<sup>2</sup> Standard Industrial Classification (SIC) system code.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this proposed action. This table lists the types of entities that EPA is now aware could potentially be regulated by this proposed action. Other types of entities not listed in the table could also be regulated. To determine whether your activities would be regulated by this proposed action, you should carefully examine the applicability criteria in 40 CFR part 80. If you have any questions regarding the applicability of this proposed action to a particular entity, consult the person listed in the preceding section.

*B. What Should I Consider as I Prepare My Comments for EPA?*

## 1. Submitting CBI

Do not submit confidential business information (CBI) to EPA through [www.regulations.gov](http://www.regulations.gov) or e-mail. Clearly mark the part or all of the information that you claim to be CBI. For CBI information in a disk or CD ROM that you mail to EPA, mark the outside of the disk or CD ROM as CBI and then identify electronically within the disk or CD ROM the specific information that is claimed as CBI. In addition to one complete version of the comment that includes information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket. Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2.

## 2. Tips for Preparing Your Comments

When submitting comments, remember to:

- Identify the rulemaking by docket number and other identifying information (subject heading, **Federal Register** date and page number).
- Follow directions - The agency may ask you to respond to specific questions or organize comments by referencing a Code of Federal Regulations (CFR) part or section number.
- Explain why you agree or disagree, suggest alternatives, and substitute language for your requested changes.
- Describe any assumptions and provide any technical information and/or data that you used.

- If you estimate potential costs or burdens, explain how you arrived at your estimate in sufficient detail to allow for it to be reproduced.
- Provide specific examples to illustrate your concerns, and suggest alternatives.
- Explain your views as clearly as possible, avoiding the use of profanity or personal threats.
- Make sure to submit your comments by the comment period deadline identified.

## **Outline of this preamble**

### **I. Executive Summary**

#### **A. Purpose of This Action**

#### **B. Summary of Major Provisions in This Notice**

1. Cellulosic Biofuel Volume for 2014
2. Biomass-Based Diesel Requirement in 2014 and 2015
3. Advanced Biofuel and Total Renewable Fuel in 2014
4. Proposed Annual Percentage Standards for 2014

#### **C. Volume Requirements for 2015 and Beyond**

### **II. Proposed Cellulosic Biofuel Volume for 2014**

#### **A. Statutory Requirements**

#### **B. Cellulosic Biofuel Volume Assessment for 2014**

1. Potential Domestic Producers with Approved Pathways

2. Potential Domestic Producers without Existing Pathways
3. Potential Foreign Sources of Cellulosic Biofuel
4. Summary of Volume Projections for Individual Companies
- C. Proposed Cellulosic Biofuel Volume for 2014
- D. Rescission of the 2011 Cellulosic Biofuel Standards
- III. Proposed National Volume Requirement for Biomass-Based Diesel in 2014 and 2015
  - A. Statutory Requirements
  - B. Compliance with 2013 Volume Requirement of 1.28 Billion Gallons
  - C. Determination of Applicable Volume for 2014 and 2015
- IV. Proposed National Volume Requirements for Advanced Biofuel and Total Renewable Fuel for 2014
  - A. Statutory Authorities for Reducing Volumes to Address Biofuel Availability and the Ethanol Blendwall
    1. Cellulosic Waiver Authority
    2. General Waiver Authority
    3. Combining Authorities for Reductions in Advanced Biofuel and Total Renewable Fuel
  - B. Determination of Reductions in Total Renewable Fuel
    1. Estimating Ethanol Volumes that Could Reasonably Be Consumed
      - a. Projected Composition of 2014 Gasoline Supply
      - b. Assessment of E85 Consumption
      - c. Proposed Projection of E85 Consumption in 2014
      - d. Estimating Total Ethanol Consumption in 2014
    2. Estimating Availability of Non-Ethanol Renewable Fuel Volumes



- a. Non-Ethanol Cellulosic Biofuel
  - b. Biomass-Based Diesel
  - c. Non-Ethanol Advanced Biofuel
  - d. Non-Ethanol Non-Advanced Renewable Fuel
- 3. Treatment of Carryover RINs in 2014
- 4. Proposed Range for the Volume Requirement for Total Renewable Fuel
- C. Determination of Reductions in Advanced Biofuel
  - 1. Available Volumes of Advanced Biofuel in 2014
    - a. Cellulosic biofuel
    - b. Biomass-Based Diesel
    - c. Domestic Production of Other Advanced Biofuel
    - d. Imported Sugarcane Ethanol
    - e. Summary
  - 2. Options for Determining Appropriate Reductions in Advanced Biofuel
    - a. Option 1: Advanced Biofuel Availability
    - b. Option 2: Full Reduction in Cellulosic Biofuel
    - c. Option 3: Availability, Growth, and Limits on Ethanol Consumption
- D. Summary of Proposed Volume Requirements for 2014
- E. Volume Requirements for 2015 and Beyond
- V. Proposed Percentage Standards for 2014
  - A. Background
  - B. Calculation of Standards
    - 1. How Are the Standards Calculated?

2. Small Refineries and Small Refiners

3. Proposed Standards

VI. Public Participation

A. How Do I Submit Comments?

B. How Should I Submit CBI to the Agency?

VII. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563:  
Improving Regulation and Regulatory Review

B. Paperwork Reduction Act

C. Regulatory Flexibility Act

D. Unfunded Mandates Reform Act

E. Executive Order 13132: Federalism

F. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

G. Executive Order 13045: Protection of Children from Environmental Health Risks and  
Safety Risks

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect  
Energy Supply, Distribution, or Use

I. National Technology Transfer and Advancement Act

J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority  
Populations and Low-Income Populations

VIII. Statutory Authority

## **I. Executive Summary**

The Renewable Fuel Standard (RFS) program began in 2006 pursuant to the requirements in Clean Air Act (CAA) section 211(o) which was added through the Energy Policy Act of 2005 (EPAct). The statutory requirements for the RFS program were subsequently modified through the Energy Independence and Security Act of 2007 (EISA), resulting in the publication of major revisions to the regulatory requirements on March 26, 2010<sup>1</sup>.

The national volumes of renewable fuel to be used under the RFS program each year (absent an adjustment or waiver by EPA) are specified in CAA section 211(o)(2). The volumes for 2014 are shown in Table I-1. Note that cellulosic biofuel and biomass-based diesel categories are nested within advanced biofuel, which is itself nested within the renewable fuel category.

---

<sup>1</sup> 75 FR 14670

Table I-1

Required Applicable Volumes in Billion Gallons (bill gal) in the Clean Air Act for 2014

Cellulosic biofuel	1.75 <sup>a</sup>
Biomass-based diesel	≥1.0 <sup>b</sup>
Advanced biofuel	3.75 <sup>a</sup>
Renewable fuel	18.15 <sup>a</sup>

<sup>a</sup> Ethanol-equivalent volume

<sup>b</sup> Actual volume. The ethanol-equivalent volume would be 1.5 if biodiesel is used to meet this requirement.

Under the RFS program, EPA is required to determine and publish annual percentage standards for each compliance year by November 30 of the previous year. The percentage standards are calculated so as to ensure use in transportation fuel of the national “applicable volumes” of four types of biofuel (cellulosic biofuel, biomass-based diesel, advanced biofuel, and total renewable fuel) that are either set forth in the Clean Air Act or established by EPA in accordance with the Act’s requirements. The percentage standards are used by obligated parties (generally, producers and importers of transportation fuel) to calculate their individual compliance obligations. The percentage standards are applied to the volume of non-renewable transportation fuel that each obligated party produces or imports during the specified calendar year to determine the volumes of renewable fuel that must be used as transportation fuel, heating oil, or jet fuel.

As required by statute, we are proposing to establish the volume for cellulosic biofuel based on projected availability of such fuel – which is below the statutory target for 2014. In addition, we have evaluated the availability of qualifying renewable fuels and factors that in some cases limit supplying those fuels to the vehicles and equipment that can consume them, including the set of factors referred to as the ethanol blendwall. Based on this evaluation we believe that adjustments to the volumes of advanced biofuel and total renewable fuel required under the statute are warranted for 2014 due to an inadequate domestic supply of these fuels (see Section IV.A for further detail). We are also proposing to maintain the same volume for biomass-based diesel for 2014 and 2015 as was adopted for 2013. The volumes that we are proposing for 2014, as well as the ranges on which we are seeking comment, are shown below. With the exception of the volume requirement for cellulosic biofuel, the proposed volumes correspond to the preferred approach described in today’s proposal, but we discuss and are seeking comment on alternative approaches as well.

Table I-2

Proposed 2014 Volume Requirements<sup>a</sup>

	Proposed Volume	Projected Range
Cellulosic biofuel	17 mill gal	8 - 30 mill gal
Biomass-based diesel	1.28 bill gal	1.28 bill gal <sup>b</sup>
Advanced biofuel	2.20 bill gal	2.00 - 2.51 bill gal
Renewable fuel	15.21 bill gal	15.00 - 15.52 bill gal

<sup>a</sup> All volumes are ethanol-equivalent, except for biomass-based diesel which is actual.

<sup>b</sup> EPA is requesting comment on alternative approaches and higher volumes.

Section II contains a detailed discussion of the basis for our proposed volume of cellulosic biofuel for 2014, Section III contains a detailed discussion of the basis for our proposed volume of biomass-based diesel for 2014 and 2015, and Section IV contains a detailed discussion of the basis for our proposed volumes, as well as alternative potential approaches on which we are requesting comment, for advanced biofuel and total renewable fuel for 2014.

In developing this proposal, we have been cognizant that Congress anticipated and intended the RFS program to promote substantial, sustained growth in biofuel production and consumption – beyond the levels that have been achieved to date. Although current gasoline demand and forecasts of future gasoline demand have decreased since EISA’s enactment in 2007, EPA continues to support the objective of continued growth in renewable fuel production and consumption, as well as the central policy goals underlying the RFS program: reductions in greenhouse gas emissions, enhanced energy security, economic development, and technological innovation. The approach reflected in today’s proposal is consistent with those objectives and is intended to put the RFS program on a manageable trajectory while supporting continued growth in renewable fuels over time. As emphasized throughout the proposal, we are seeking comment and information on a variety of alternative approaches as well as ranges of inputs and methodologies relevant to setting these standards, and look forward to engagement with stakeholders on all aspects of the proposal.

*A. Purpose of This Action*

EPA is today proposing annual volume requirements for obligated parties for cellulosic biofuel, biomass-based diesel, advanced biofuel, and total renewable fuel for 2014. Table I.A-1 lists the statutory provisions and associated criteria relevant to determining the national applicable volumes used to set the applicable standards in today's proposed rule.

Table I.A-1

## Statutory Provisions for Determination of Applicable Volumes

Applicable volumes	Clean Air Act reference	Criteria provided in statute for determination of applicable volume
Cellulosic biofuel in 2014	211(o)(7)(D)(i)	Required volume must be lesser of volume specified in CAA 211(o)(2)(B)(i)(III) or EPA's projected volume.
Biomass-based diesel in 2014 and 2015	211(o)(2)(B)(ii) and (v)	Required volume for years after 2012 must be at least 1.0 bill gal, and must be based on a review of implementation of the program and an analysis of several factors.
Advanced biofuel in 2014	211(o)(7)(D)(i)	If applicable volume of cellulosic biofuel is reduced to the projected volume, EPA may reduce advanced biofuel and total renewable fuel by the same or lesser volume. No criteria specified.
	211(o)(7)(A)	EPA may waive any portion of the statutory volume requirements if implementation of those requirements would severely harm the economy or environment of a State, region, or the United States, or there is an inadequate domestic supply.



Total renewable fuel in 2014	211(o)(7)(D)(i)	If applicable volume of cellulosic biofuel is reduced to the projected volume, EPA may reduce advanced biofuel and total renewable fuel by the same or lesser volume. No criteria specified.
	211(o)(7)(A)	EPA may waive any portion of the statutory volume requirements if implementation of those requirements would severely harm the economy or environment of a State, region, or the United States, or there is an inadequate domestic supply.

Under the statute, EPA must annually determine the projected volume of cellulosic biofuel production for the following year. If the projected volume of cellulosic biofuel production is less than the applicable volume specified in section 211(o)(2)(B)(i)(III) of the statute, EPA must lower the applicable volume used to set the annual cellulosic biofuel percentage standard to the projected volume of production available during the year. In today's proposed rule, we present our analysis of cellulosic biofuel production and projected volume for 2014. This analysis is based on our evaluation of individual producers' production plans and progress to date following discussions with cellulosic biofuel producers, the Energy Information Administration (EIA), the Department of Agriculture (USDA), and the Department of Energy

(DOE), and includes an assessment of the probabilities associated with production schedules from each of these producers.

While CAA section 211(o)(2)(B) specifies the volumes of biomass-based diesel to be used in the RFS program through year 2012, it directs the EPA to establish the applicable volume of biomass-based diesel for years after 2012. The statute also lists the factors that must be considered in this determination. In today's action we are proposing volume requirements for biomass-based diesel for both 2014 and 2015.

There are two different authorities in the statute that permit EPA to reduce volumes of advanced biofuel and total renewable fuel below the volumes specified in the statute. When we lower the applicable volume of cellulosic biofuel below the volume specified in CAA 211(o)(2)(B)(i)(III), we also have the authority to reduce the applicable volumes of advanced biofuel and total renewable fuel by the same or a lesser amount. We can also reduce the applicable volumes of advanced biofuel or total renewable fuel under the general waiver authority provided at CAA 211(o)(7)(A) under certain conditions. Today's proposal uses a combination of these two authorities to reduce volumes of both advanced biofuel and total renewable fuel to address two important realities:

- Limitations in the volume of ethanol that can be consumed in gasoline given practical constraints on the supply of higher ethanol blends to the vehicles that can use them and other limits on ethanol blend levels in gasoline – a set of factors commonly referred to as the ethanol "blendwall"

- Limitations in the ability of the industry to produce sufficient volumes of qualifying renewable fuel

As described in detail in Section IV, today's action lays out a framework for determining the applicable volume requirements that addresses these two realities. We are proposing to use this framework to establish the volume requirements in 2014. As described in more detail in Section IV.E, we believe that this framework would also be appropriate for later years, subject to adjustments made in the course of the rulemaking process and taking into account the specific facts about the availability of renewable fuels at the time of the final rulemaking.

In today's proposed rule we have also provided the annual percentage standards (shown in Section I.B.4 below) that would apply to all producers and importers of gasoline and diesel in 2014. The percentage standards, which establish the legal requirement for the obligated parties, are based on the 2014 applicable volumes that we project for the four types of renewable fuel and a projection of volumes of gasoline and diesel consumption in 2014 from the Energy Information Administration (EIA).

#### *B. Summary of Major Provisions in This Notice*

##### *1. Cellulosic Biofuel Volume for 2014*

The cellulosic biofuel industry continues to transition from research and development (R&D) and pilot scale to commercial scale facilities, leading to significant increases in production capacity. RIN generation from the first commercial scale cellulosic biofuel facility began in March 2013.<sup>2</sup> A second facility began producing fuel in July 2013 with several others expected to follow in 2014. Based on information we have collected from these companies and discussions with EIA, we have identified five companies we expect to produce cellulosic biofuel in 2014. There are an additional three companies that may be in a position to produce cellulosic biofuel if additional pathways are approved by EPA. Each of the relevant facilities is listed in Table I.B.1-1 along with our estimate of their projected 2014 volume. Based on the information we have received from these companies, our conversations with other government agencies, and EPA's own engineering judgment we are projecting that 8 - 30 million ethanol-equivalent gallons of cellulosic biofuel will be available in 2014. This range does not account for the estimate that EIA is required to provide to EPA containing estimates of the volume of cellulosic biofuel projected to be sold or introduced into commerce in 2014. The projected range also does not include any volume from facilities that could use pathways which have not yet been approved. If production volumes from these facilities were included, we would project a production range of 53 - 83 million ethanol-equivalent gallons.

As part of estimating the volume of cellulosic biofuel that would be made available in the U.S. in 2014, we researched all potential production sources by company and facility. This included sources that were still in the planning stages, those that were under construction, and those that are already producing some volume of cellulosic ethanol, cellulosic diesel, or some

---

<sup>2</sup> A RIN is unique number generated by the producer and assigned to each gallon of a qualifying renewable fuel under the RFS program, and is used by refiners and importers to demonstrate compliance with the volume requirements under the program.

other type of cellulosic biofuel. Facilities primarily focused on research and development were not the focus of our assessment as production from these facilities represents very small volumes of cellulosic biofuel, and these facilities typically have not generated RINs for the fuel they have already produced. From this universe of potential cellulosic biofuel sources, we identified the subset that is expected to produce commercial volumes of qualifying cellulosic biofuel for use in 2014. To arrive at a projected volume for each facility, we developed company specific projections based on discussions with cellulosic biofuel producers, EIA, USDA, and DOE, and on factors such as the current and expected state of funding, the status of the technology utilized, progress towards construction and production goals, and other significant factors that could potentially impact fuel production or the ability of the produced fuel to qualify for cellulosic biofuel Renewable Identification Numbers (RINs) in 2014. Further discussion of these factors can be found in Section II.B.

In our assessment we focused on domestic sources of cellulosic biofuel. At the time of this proposed rule no internationally-based cellulosic biofuel production facilities have registered under the RFS program and therefore no volume from international producers has been included in our projections for 2014.

Table I.B.1-1

Projected Available Cellulosic Biofuel Plant Volumes in Million Gallons (mill gal) for 2014

Company	Location	Fuel type	Annual Production Capacity <sup>a</sup>	First Production	Projected 2014 available volume <sup>b</sup>
Companies with Approved Pathways					
Abengoa	Hugoton, KS	Ethanol	24	1Q 2014 <sup>c</sup>	0 – 18
DuPont	Nevada, IA	Ethanol	30	2H 2014 <sup>c</sup>	0 – 2
INEOS Bio	Vero Beach, FL	Ethanol	8	3Q 2013	2 – 5
KiOR	Columbus, MS	Gasoline and Diesel	11	March 2013	0 – 9
Poet	Emmetsburg, IA	Ethanol	25	1H 2014 <sup>c</sup>	0 – 6
Total for companies with approved pathways					8 - 30 <sup>d</sup>
Other Potential Cellulosic Biofuel Producers					
CNG/LNG Producers	Various	CNG/LNG	Various	Various	35 – 54
Edeniq	Various	Ethanol	Various	1H 2014 <sup>c</sup>	0 - 7
Ensyn	Stanley, WI	Heating Oil	3	2007	0 – 5
Total for both companies with approved pathways and those with proposed pathways					53 - 83 <sup>d</sup>

<sup>a</sup> Facilities are generally designed to process a given quantity of feedstock and volume capacities may vary depending on yield assumptions

<sup>b</sup> Volumes listed in million ethanol-equivalent gallons

<sup>c</sup> Start-up dates for these facilities are projections

<sup>d</sup> Total volumes are the result of Monte Carlo simulations rather than the sum of the low and high end of the range of projected available volume for each company. See Section II.C for more detail.

In projecting the actual volume of cellulosic biofuel that will be available for use in 2014, we have taken into account variation in expected start-up times, along with the facility production capacities, company production plans, the progress made in 2013, expected production distribution and a variety of other factors. We used this information to determine the most likely production ranges for each of the individual companies and a production probability distribution within the range. We then used a Monte Carlo simulation to aggregate the individual ranges into a production projection for the cellulosic biofuel industry as a whole in 2014. We believe this method results in a projected production range that better represents our expectations for cellulosic biofuel production in 2014 than simply adding the low and high end of the production ranges from each of the individual companies. Section II discusses in greater detail our projections of cellulosic biofuel in 2014 and the companies we expect to produce this volume.

In response to a recent court decision, we are also proposing to rescind the cellulosic biofuel standards for 2011. In January 2013, the United States Court of Appeals for the District of Columbia Circuit issued a decision interpreting the statutory requirements for EPA's cellulosic biofuel projections, in the context of considering a challenge to the 2012 cellulosic biofuel standard. The Court found that in establishing the applicable volume of cellulosic biofuel for 2012, EPA had used a methodology in which "the risk of overestimation [was] set deliberately to outweigh the risk of underestimation." The Court held EPA's action to be inconsistent with the statute because EPA had failed to apply a "neutral methodology" aimed at providing a prediction of "what will actually happen," as required by the statute. As a result of

this ruling, the Court vacated the 2012 cellulosic biofuel standard. See API v. EPA, 706 F.3d 474 (D.C. Cir. 2013). EPA later removed the 2012 cellulosic biofuel requirement from the regulations.<sup>3</sup> Since we used essentially the same methodology to develop the 2011 cellulosic biofuel standard as we did to develop the 2012 standard, we believe it would be appropriate to rescind the 2011 cellulosic biofuel standard as well and accordingly are proposing to do so in today's action. The money paid by obligated parties to purchase cellulosic waiver credits to comply with the 2011 cellulosic biofuel standard would be refunded if this action is finalized.<sup>4</sup>

## 2. Biomass-Based Diesel Requirement in 2014 and 2015

While section 211(o)(2)(B) specifies the volumes of biomass-based diesel through year 2012, it directs the EPA to establish the applicable volume of biomass-based diesel for years after 2012. Moreover, the statute requires that we finalize these biomass-based diesel volume requirements no later than 14 months before the first year for which that volume requirement will apply. We did not propose a volume requirement for biomass-based diesel in the February 7, 2013 Notice of Proposed Rulemaking because at that time we were still evaluating the potential market impacts of current production levels. In order to provide sufficient time for this evaluation, as well as the other analyses we are required to conduct, we delayed our proposal for the 2014 volume requirement for biomass-based diesel.

---

<sup>3</sup> 78 FR 49794 (August 15, 2013)

<sup>4</sup> In 2011 obligated parties purchased 4,248,388 cellulosic biofuel waiver credits at a price of \$1.13 per gallon-RIN for a total cost of \$4,800,678.



In today's action we are proposing to maintain the applicable volume of 1.28 bill gallons for biomass-based diesel for both 2014 and 2015. As required by the statute when setting biomass-based diesel volume requirements for years after 2012, our proposal is based on a consideration of the factors specified in the statute, including biodiesel production, consumption, infrastructure, climate change, energy security, the agricultural sector, air quality, and others. Section III provides additional discussion of our assessment of the proposed volume of 1.28 bill gal of biomass-based diesel.

### 3. Advanced Biofuel and Total Renewable Fuel in 2014

Since the RFS2 program began in 2010, EPA has considered reductions in advanced biofuel and total renewable fuel authorized under the cellulosic waiver provisions of 211(o)(7)(D)(i). In the past we have focused primarily on the availability of advanced biofuels in determining whether reductions in the required volume of cellulosic biofuel should be accompanied by reductions in the required volumes of advanced biofuel and total renewable fuel. The total volume of renewable fuel in the form of ethanol that could reasonably be available and supplied to vehicles as either E10 or higher ethanol blends given various constraints, was not a limiting factor for years prior to 2014. However, for 2014 and later years, the total volume of ethanol that can be consumed, and the total volume of non-ethanol renewable fuels that could reasonably be available, are together expected to be less than the volume requirements established in EISA for advanced biofuel and total renewable fuel. Therefore, we are proposing

reductions in the volume requirements for these categories of renewable fuel to address these concerns.

We evaluated three potential approaches for reducing the applicable volume requirements for advanced biofuel and total renewable fuel. Each of these approaches would require use of a combination of the cellulosic and general waiver authorities at 211(o)(7)(D)(i) and 211(o)(7)(A), respectively, to address supply concerns associated with the blendwall. The three approaches differ primarily with regard to how the advanced biofuel requirement would be adjusted using these authorities. The first approach would lower the statutory volumes for advanced biofuels only to the extent that additional volumes are not projected to be available; the general waiver authority would be used to ensure that the total volume of renewable fuel would address supply concerns associated with the blendwall. The second approach would make reductions in advanced biofuel and total renewable fuel that are equal to the proposed reductions in cellulosic biofuel and would use the general waiver authority to make further reductions to the total renewable fuel requirement necessary to address the blendwall.

The third approach that we evaluated, and the one that we are proposing today, includes both a consideration of the capability of the relevant industries to make qualifying renewable fuels available, either through domestic production or importation, and also the capability of the relevant industries to ensure that those renewable fuels are used as transportation fuel, heating oil, or jet fuel.<sup>5</sup> The use of renewable fuels includes a consideration of the infrastructure available for distributing, blending, and dispensing renewable fuels, as well as appropriate

---

<sup>5</sup> While the fuels that are subject to the percentage standards are currently only non-renewable gasoline and diesel, renewable fuels that are valid for compliance with the standards include those used as transportation fuel, heating oil, or jet fuel.

vehicles in the fleet that can consume various renewable fuels, such as flex-fuel vehicles (FFVs). Our proposed framework for addressing both availability of qualifying renewable fuels and constraints on their consumption would make use of a combination of the cellulosic waiver authority at 211(o)(7)(D)(i) and the general waiver authority at 211(o)(7)(A). As described in detail in Section IV.A.2, we interpret the term "inadequate domestic supply" as it is used under the general waiver authority to include consideration of factors that affect consumption of renewable fuel. We believe the framework being proposed today best approximates the multiple goals that Congress intended in the RFS program, and we would intend this framework to apply not just to 2014, but to later years as well. However, we are soliciting comment on alternative approaches as well. We discuss the proposed framework and the alternative approaches in Section IV.

We believe that our proposed framework for determining appropriate volumes of total renewable fuel and advanced biofuel would simultaneously address the ethanol blendwall and limitations in availability of qualifying renewable fuels. For total renewable fuel, we would project the volume of ethanol that could reasonably be consumed as E10 and higher ethanol blends, and would add to that the volume of all non-ethanol renewable fuels that could reasonably be expected to be available. For advanced biofuel, we would sum the ethanol-equivalent volumes of the cellulosic biofuel requirement, the biomass-based diesel requirement, and the additional non-ethanol advanced biofuels that could reasonably be expected to be available and be consumed. In this process we have projected ranges that encompass the most likely outcomes, and we propose several approaches to determining the most likely value for the final rule.

#### 4. Proposed Annual Percentage Standards for 2014

The renewable fuel standards are expressed as a volume percentage and are used by each refiner, blender, or importer to determine their renewable fuel volume obligations. The applicable percentages are set so that if each regulated party meets the percentages, and if EIA projections of gasoline and diesel use for the coming year prove to be accurate, then the amount of renewable fuel, cellulosic biofuel, biomass-based diesel, and advanced biofuel actually used will meet the volumes required on a nationwide basis.

Four separate percentage standards are required under the RFS program, corresponding to the four separate volume requirements shown in Table I-1. The specific formulas we use in calculating the renewable fuel percentage standards are contained in the regulations at 40 CFR §80.1405 and repeated in Section V.B.1. The percentage standards represent the ratio of renewable fuel volume to projected non-renewable gasoline and diesel volume. The projected volume of transportation gasoline and diesel used to calculate the standards in today's proposed rule was derived from EIA projections. The proposed standards for 2014 are shown in Table I.B.4-2. Detailed calculations can be found in Section V, including the projected 2014 gasoline and diesel volumes used.

Table I.B.4-2

## Proposed Percentage Standards for 2014

Cellulosic biofuel	0.010 %
Biomass-based diesel	1.16 %
Advanced biofuel	1.33 %
Renewable fuel	9.20 %

*C. Volume Requirements for 2015 and Beyond*

As highlighted above, EPA continues to support the objective – reflected in the statute – of continued growth in renewable fuel production and consumption, as well as the central goals of the RFS program: enhanced energy security and reductions in greenhouse gas emissions. We also recognize that issues concerning the availability of qualifying fuels and the consumption of ethanol will continue to be relevant in 2015 and beyond, particularly in light of projections that overall gasoline demand will continue to decline while the statutory volumes for renewable fuel volumes continue to increase. Our objective in this rulemaking is to develop a general approach for determining appropriate volume requirements that can be applied not only in 2014, but also for 2015 and beyond. As we consider comments received in response to this NPRM, our intent is to develop an approach that puts the RFS program on a manageable trajectory while supporting continued growth in renewable fuels over time. The proposed approach described in today's NPRM can and will account for new and improved data and changes in circumstances over time, including the substantial efforts underway to increase the volume of biofuel produced

and consumed in the United States. Many companies, often supported by various government programs, are continuing to invest in efforts ranging from research and development to the construction of commercial scale facilities resulting in the ongoing growth of next generation biofuels. Similar efforts on the part of both public and private sectors are growing the infrastructure to enable expansion in the use of gasoline fuel blends containing greater than 10 percent ethanol. Under the right circumstances, there is substantial potential for continued growth in the use of ethanol and next generation biofuels, both in the near term and into the future. As both ethanol and non-ethanol renewable fuel volumes grow, the proposed methodology set forth in today's proposed rule will incorporate this growth into the development of the standards for the following year, providing an ongoing incentive for growth of biofuels. We recognize that a number of challenges must be overcome to fully realize the potential that exists for increased production and consumption of renewable fuels in the United States. We also recognize that while the RFS program is a central element of our domestic biofuels policy, a range of other tools, programs, and actions have the potential to play an important complementary role. We request information and ideas on what actions could be taken by the variety of industry and other private stakeholders, as well by the government, to help overcome these challenges, continue to foster innovation, and minimize the need for adjustments in the statutory renewable fuel volume requirements in the future.

## **II. Proposed Cellulosic Biofuel Volume for 2014**

In order to project the volume of cellulosic biofuel production in 2014 for use in setting the applicable percentage standard, we considered information we received from EIA and information we collected from individual facilities that have the potential to produce qualifying volumes for consumption as transportation fuel, heating oil, or jet fuel in the U.S. in 2014. This section describes the volumes that we project will be produced or imported in 2014 as well as some of the uncertainties associated with those volumes.

In the past several years the cellulosic biofuel industry has continued to progress. The first cellulosic biofuel RINs under the current RFS regulations were produced in 2012 at two small demonstration scale facilities. During 2013, the first commercial scale cellulosic biofuel facilities have successfully completed commissioning and began fuel production, and several more large scale commercial production facilities are expected to begin fuel production in 2014. Projected costs for the production of cellulosic biofuels continues to fall as a result of ongoing technology development and operating experience gained from many research and development and demonstration-scale facilities across the country. These important advances include higher biofuel yields per ton of feedstock as well as lower enzyme and catalyst costs. As a result of these advances, the projected capital costs and energy costs to produce a gallon of cellulosic biofuel have decreased. New feedstock supply chains, which will be necessary to provide the raw materials for anticipated commercial facilities, have been established, and in several cases companies have signed contracts to obtain significant quantities of feedstocks for their first commercial facilities. EPA has also approved new pathways to increase the variety of fuels for

which cellulosic RINs can be generated and the feedstocks from which these fuels can be produced. These factors have combined to continue to reduce the perceived technical, financial, and regulatory risks associated with the cellulosic biofuel industry and place the cellulosic biofuel industry on firm ground for future growth.

Although the cellulosic biofuel industry faces many challenges and RIN-generating cellulosic biofuel production continues to be limited, the industry is growing incrementally, both in the United States and around the world.<sup>6</sup> New facilities projected to be brought online in the United States in 2014 would increase the production capacity of the cellulosic industry by approximately 600 percent. The following section discusses the companies the EPA reviewed in the process of projecting cellulosic biofuel production for use as a transportation fuel in the United States in 2014. Information on these companies forms the basis for our projection that the volume of cellulosic biofuel produced in 2014 is likely to be in the range of 8 - 30 million gallons. EPA will continue to monitor the progress of these facilities, as well as any others of which we become aware that have the potential for cellulosic biofuel production in 2014, in order to have the most up to date information possible to set the cellulosic biofuel standard in the final rule.

#### *A. Statutory Requirements*

---

<sup>6</sup> As of July 31, 2013, 215,044 RINs that can be used to fulfill the cellulosic biofuel standard (D3 and D7 RINS) have been generated.



The volumes of renewable fuel to be used under the RFS program each year (absent an adjustment or waiver by EPA) are specified in CAA 211(o)(2). For 2014, the statute specifies a cellulosic biofuel volume requirement of 1.75 billion gallons. The statute requires that if EPA determines, based on EIA's estimate, that the projected volume of cellulosic biofuel production for the following year is less than the applicable volume EPA is to reduce the applicable volume of cellulosic biofuel to the projected volume available during that calendar year.

In addition, if EPA reduces the required volume of cellulosic biofuel below the level specified in the statute, the Act also indicates that we may reduce the applicable volumes of advanced biofuels and total renewable fuel by the same or a lesser volume. Our consideration of the 2014 volume requirements for advanced biofuels and total renewable fuel is presented in Section IV.

#### *B. Cellulosic Biofuel Volume Assessment for 2014*

In order to project cellulosic biofuel production for 2014, we have tracked the progress of several dozen potential cellulosic biofuel production facilities. As for the 2013 annual volumes, we have focused on facilities with the potential to produce commercial volumes of cellulosic biofuel rather than small R&D or pilot scale facilities as the larger commercial scale facilities are much more likely to generate RINs for the fuel they produce and the volumes they produce will have a far greater impact on the cellulosic biofuel standard for 2014. From this list of facilities we used publically available information, as well as information provided by DOE, EIA, and

USDA, to make a preliminary determination of which facilities are the most likely candidates to produce cellulosic biofuel and generate cellulosic biofuel RINs in 2014. Each of these companies was investigated further in order to determine the current status of its facilities and its likely cellulosic biofuel production and RIN generation volumes for the coming years. Information such as the funding status of these facilities, current status of the production technologies, announced construction and production ramp-up periods, and annual fuel production targets were all considered when we spoke with representatives of each company to discuss cellulosic biofuel target production levels for 2014. Throughout this process EPA has been in contact with EIA to discuss relevant information.

For each company included in our 2014 volume projections EPA has established a range of potential production volume such that it is possible, but highly unlikely, that the actual production will be above or below the range.<sup>7</sup> The low end of the range for each company is designed to represent the volume of fuel EPA believes each company is likely to produce if they are unable to begin fuel production on their expected start-up date and/or experience challenges that result in reduced production volumes or a longer than expected ramp-up period. Experience to date with cellulosic biofuel production facilities is that historically they have been unable to achieve announced start-up dates and production volumes in their first few years of expected production. To project a low end of the range of production volumes, therefore, we must consider the likely minimum volume of fuel new facilities are likely to produce if they experience similar delays and setbacks. The low end of the range for any facilities that have not yet begun producing cellulosic biofuel is set at zero in our assessment. This reflects the

---

<sup>7</sup> For the purposes of the Monte Carlo simulation, discussed in more detail later, this range will be treated as representing the 90% confidence interval.

uncertainties related to these facilities' start-up dates, the possibility that any remaining construction and commissioning timelines may be delayed, and the possibility that initial fuel volumes are likely to be small.

If a facility has already begun production any uncertainty related to its start-up date is no longer relevant and the remaining uncertainty primarily relates to the facility's ability to achieve steady state production and target yields as it progresses towards production rates that reflect the facility's nameplate capacity. For these facilities, production history is a significant factor in establishing the low end of the projected production range. It is important to note that the low end of the range does not represent a worst-case scenario. The worst-case scenario for any of these facilities is zero, as it is always possible that extreme circumstances or natural disasters may result in extended delays, project cancellation, or liquidation. While not denying this possibility for any of the facilities included in our projections, several have made sufficient progress that we believe a non-zero value for the low end of the range is appropriate. For these facilities we believe it is highly unlikely that the production volume will fail to exceed the low end of their projected production range in 2014. Further discussion on the basis for the low end of the projected production range for each facility is included in the company descriptions in the following sections.

To determine the high end of the range of expected production volumes for each company we considered a variety of factors, including company history, expected start-up date and ramp-up period, facility capacity, and others mentioned above. As a starting point, EPA calculated a production volume using the expected start-up date and facility capacity assuming

our best-case scenario benchmark of a six-month straight-line ramp-up period. Any production volumes that exceeded this volume were not considered to be credible, even for the high end of the range of expected production volumes. If the production estimate EPA received from a company was lower than the volume calculated using the methodology above, EPA used the company production targets instead. In some cases these volumes were discounted further based on the history of these companies or EPA's engineering judgment. More information on the process used to project the high end of the range of expected production volumes for each company can be found below. This process is similar to the process used in the 2013 standards Notice of Proposed Rulemaking (NPRM) to calculate the expected production for each company.

We believe our range of projected production volumes for each company represents the range of what is likely to actually happen for each company. A brief description can be found below for each of the companies we believe will produce cellulosic biofuel and make it commercially available in 2014. We will continue to gather more information to help inform our decision regarding the cellulosic biofuel volume to be required for 2014 in the final rule. In the sections that follow, we first discuss domestic cellulosic biofuel production facilities with an approved RIN generating pathway, followed by facilities with pathways that have been proposed or are currently being evaluated by EPA, and finally foreign cellulosic biofuel producers.

EPA has determined a range of potential production volumes for each company rather than a single value as a range better reflects the uncertainty associated with the production from each company. Additionally, there are a large number of companies that EPA must assess and aggregate to produce a single national volume covering the entire cellulosic biofuel industry.

We believe that our projected production volume for the cellulosic biofuel industry as a whole is more accurate if it is done in such a way as to reflect the uncertainty associated with each of the companies that contribute to the projection. As discussed in more detail in Section II.C below, EPA is using a Monte Carlo simulation as a tool to combine our production projections for each individual company to determine a reasonable range of cellulosic biofuel production in 2014 for the entire industry in a way that reflects the uncertainty across the full suite of facilities. This projected range provides a basis for public comment and helps to inform our ultimate decision on the single value for the final rule that best represents the projected volume of cellulosic that will be available in 2014. Alternative methods to combine our production projections are discussed further in Section IV.

1. Potential Domestic Producers with Approved Pathways

The companies and facilities discussed in this section all have the potential to produce cellulosic biofuel for use as transportation fuel, heating oil, or jet fuel in the United States in 2014. Both INEOS Bio and KiOR began producing cellulosic biofuel at commercial-scale in 2013. The remaining seven are in various stages of construction. All seven of these facilities project the successful completion of construction of commercial scale facilities and initial fuel production in 2014. The strong financial incentive provided by the cellulosic RINs, combined with the fact that all these facilities are located in the United States and intend to use approved

pathways, give us a high degree of confidence that any fuel they produce will also generate corresponding cellulosic biofuel RINs.<sup>8</sup>

In order to generate RINs, each of these companies must register under the RFS program and comply with all applicable recordkeeping and reporting requirements. This includes using an approved RIN-generating pathway and verifying that their feedstocks meet the definition of renewable biomass.

### *Abengoa*

Abengoa, a large international biofuels company, has developed an enzymatic hydrolysis technology to convert corn stover and other agricultural waste feedstocks into ethanol. After successfully testing and refining their technology at a pilot scale facility in York, Nebraska as well as in a demonstration-scale facility in Salamanca, Spain, Abengoa is now working towards the completion of their first commercial scale cellulosic ethanol facility in Hugoton, Kansas. After successfully proving their technology at commercial scale in Hugoton, Abengoa currently plans to construct additional similar cellulosic ethanol production facilities, either on greenfield sites or co-locating these new facilities with their currently existing starch ethanol facilities around the United States.

---

<sup>8</sup> In 2012, approximately 20,000 gallons of cellulosic biofuel produced in the US was exported to Brazil to be used for promotional purposes. We believe the circumstances surrounding this export of cellulosic biofuel were unique, including significant investment in the company that produced the fuel by Petrobras, and are unlikely to be repeated by the companies included in future years.

Abengoa has contracts in place to provide the majority of feedstocks necessary for the Hugoton facility for the next 10 years and successfully completed their first biomass harvest in the fall of 2011. Construction at this facility, which began in September 2011, is expected to take approximately two years and be completed in the fourth quarter of 2013. All of the major process equipment for this project has been purchased and all of the required permits for construction have been approved. Abengoa's Hugoton facility is being partially funded by a \$132 million Department of Energy (DOE) loan guarantee.

When completed, the Hugoton plant will be capable of processing 700 dry tons of corn stover per day, with an expected annual ethanol production capacity of approximately 24 million gallons. Abengoa plans to begin producing fuel at the facility in January 2014, shortly after completing construction in late 2013, and to be producing fuel at rates near the nameplate capacity by the end of the second quarter of 2014. They are currently projecting 17 – 20 million gallons of cellulosic ethanol production from this facility in 2014.<sup>9</sup> This range of volumes is consistent with the 18 million gallons EPA would project if we assume production starts on January 1, 2014 and use the six-month ramp-up period as a benchmark best case scenario for new cellulosic biofuel production facilities. To date construction at the Abengoa facility has proceeded as expected and EPA has no reason to believe this facility is less likely to achieve their production targets than any other new first-of-a-kind cellulosic biofuel facility. EPA is therefore using 18 million gallons of cellulosic ethanol as the high end of the projected production range from Abengoa in today's proposed rule. For the low end of the production range, EPA is projecting a volume of 0 gallons, consistent with our projections for all facilities

---

<sup>9</sup> Email from Chris Standlee, Executive Vice President of Institutional Affairs, Abengoa to Dallas Burkholder, US EPA. Received June 26, 2013.

that have not yet begun producing commercial volumes of cellulosic biofuel. This significantly reduced volume reflects the fact that no commercial scale cellulosic biofuel facility has yet been able to achieve its target date for the first production of fuel. Any delay in the start-up date of this facility would have a significant negative impact on production in 2014 and may result in production being delayed until 2015.

### *Cool Planet Biofuels*

Cool Planet Biofuels has developed a process to convert a variety of forms of cellulosic biomass into a renewable gasoline product. Their process uses pressure and heat to convert the cellulosic biomass to a hydrocarbon stream in a biomass fractionator which is then upgraded using proprietary catalysts into a renewable gasoline product. Cool Planet Biofuels plans to deploy relatively small scale production units capable of producing 10 million gallons of fuel per year that can be located near readily available sources of cellulosic biomass. In December 2012 Cool Planet Biofuels began producing fuel from their 400,000 gallon per year demonstration scale facility that is currently being used for testing purposes.

Cool Planet Biofuels plans to begin producing fuel at their first commercial scale unit, with a nameplate capacity of 10 million gallons per year by the end of 2014. The location of this facility has not yet been announced, and it is unclear whether Cool Planet Biofuels has raised sufficient funds for the construction of this facility. Cool Planet Biofuels claims that the very short construction time they anticipate for their facility relative to cellulosic biofuel production facilities of similar size, which generally take at least two years to build, is made possible by



their use of very little novel equipment. The majority of the facility is composed of units already used in commercial operation in other applications that will be purchased from vendors and assembled by Cool Planet Biofuels. The facility will be constructed on cargo container skids and then transported to the fuel production site.

EPA believes that it may be possible for Cool Planet Biofuels to produce cellulosic biofuel from their first commercial scale production facility in 2014, but any production from this facility is highly uncertain. Historically the construction of cellulosic biofuel production facilities has taken multiple years, with delays to the initial construction schedules common. Cool Planet's unique construction plan may allow for a reduced construction timeframe; however we do not believe it would be appropriate to rely on this in projecting available volumes of cellulosic biofuel in 2014. We have therefore not included any volume from Cool Planet Biofuels in our projection of the potentially available volume of cellulosic biofuel in 2014 in today's proposal.

#### *DuPont*

DuPont has developed an enzymatic process to convert corn stover into cellulosic ethanol. DuPont has invested hundreds of millions of dollars to develop this technology and since 2009 has operated a small demonstration scale facility in Vonore, Tennessee. In addition to developing technology for converting cellulosic biomass to ethanol, DuPont has been working with corn producers, equipment manufacturers, and Iowa State University to develop expertise in the collection, transportation, and storage of the biomass feedstock for their cellulosic ethanol

facilities. On March 29, 2013 DuPont signed an agreement with USDA to promote the sustainable harvesting of feedstocks for cellulosic biofuel facilities.

On November 30, 2012 DuPont began the construction of their first commercial scale cellulosic ethanol facility in Nevada, Iowa. When completed, this facility will have a nameplate production capacity of 30 million gallons of cellulosic ethanol per year. DuPont currently plans to achieve mechanical completion at this facility in June 2014 and to begin production in the second half of 2014. They are currently projecting the production of approximately 3 million gallons of cellulosic ethanol from this facility in 2014; however they acknowledge that even slight delays in their expected construction timeline could have significant impacts on their fuel production in 2014. Using EPA's best-case benchmark of a six month straight-line ramp-up period assuming a production startup date of October 1, 2014 would result in an expected production of approximately 2 million gallons in 2014. Due to the start-up date that is late in the year, however, even a relatively minor delay in the construction and commissioning timeline or unforeseen challenges in start-up would result in no production from this facility in 2014. We have projected a range of 0 – 2 million gallons of cellulosic biofuel from DuPont's Nevada, Iowa facility in 2014.

### *Fiberight*

Fiberight uses an enzymatic hydrolysis process to convert the biogenic portion of separated municipal solid waste (MSW) and other waste feedstocks into ethanol. They have successfully completed five years of development work on their technology at their small pilot

plant in Lawrenceville, Virginia. In 2009 Fiberight purchased an idled corn ethanol plant in Blairstown, Iowa with the intention of making modifications to this facility to allow for the production of 6 million gallons of cellulosic ethanol per year from separated MSW and industrial waste streams. These modifications were scheduled to be completed in 2011, but difficulties in securing funding have resulted in construction at this facility being delayed. In January 2012 Fiberight was offered a \$25 million loan guarantee from USDA. Closing on this loan would provide substantially all of the remaining funds required for Fiberight to complete the required modifications at their Blairstown facility. Additional construction will be required at this facility before the production of cellulosic biofuel can begin, and the company expects that this construction will take approximately 6 months to complete. Additionally, Fiberight's waste separation plan for this facility was approved in June 2012 allowing Fiberight to generate RINs for the cellulosic ethanol they produce using separated MSW as a feedstock. Because of the uncertainty surrounding Fiberight's funding status, the lack of progress towards the completion of the modifications at their Blairstown, Iowa facility, and their history of production delays EPA is not including any volume from Fiberight in today's proposal.

### *INEOS Bio*

INEOS Bio has developed a process for producing cellulosic ethanol by first gasifying cellulosic feedstocks into a synthesis gas (syngas) and then using naturally occurring bacteria to ferment the syngas into ethanol. In January 2011, USDA announced a \$75 million loan guarantee for the construction of INEOS Bio's first commercial facility to be built in Vero Beach, Florida. This loan was closed in August 2011. This was in addition to the grant of up to

\$50 million INEOS Bio received from DOE in December 2009. At full capacity, this facility will be capable of producing 8 million gallons of cellulosic biofuel as well as 6 megawatts (gross) of renewable electricity from a variety of feedstocks including food and yard waste, agricultural residues, slash and pre-commercial thinnings, and tree residues from tree plantations.<sup>10</sup> The facility also plans to use a limited quantity of separated MSW as a feedstock after initial start-up.

On February 9, 2011, INEOS Bio broke ground on this facility. INEOS Bio completed construction on this facility in June 2012 and began full commissioning of the facility. In August 2012 INEOS Bio received approval from EPA for their yard waste separation plan and successfully registered their Vero Beach, FL facility under the RFS program. In October 2012 the facility began producing renewable electricity. INEOS Bio entered the start-up phase of cellulosic ethanol production in November 2012. During this phase the facility was not run continually, as facility modifications continued to be made; however, a small volume of cellulosic ethanol was successfully produced. On July 31, 2013, INEOS Bio announced they had begun producing cellulosic ethanol at commercial scale from their Vero Beach facility. INEOS Bio currently projects cellulosic ethanol production at this facility to be 4-5 million gallons in 2013. As this volume is less than what would be projected using our best-case ramp-up benchmark we believe it is an appropriate volume to represent the upper end of INEOS Bio's potential production range for 2014.

---

<sup>10</sup> Both slash and pre-commercial thinnings and tree residue from tree plantations must come from non-federal forestland to qualify as a feedstock in the RFS program. Additionally slash and pre-commercial thinnings must come from land that is not ecologically sensitive forest land.

There is, however, significant uncertainty in the ability of this facility to achieve these production volumes in 2014. The facility has not yet reached production rates consistent with its projected production volume, and production ramp-up could take longer than expected. INEOS Bio also experienced several setbacks to production related to weather-caused power losses at the facility. While they are working to protect against these issues in the future by enabling the facility to operate in a self-sustaining mode, the possibility of future interruption due to serious weather events will still exist. For this proposed rule we are projecting a production range of 2 – 5 million gallons of cellulosic ethanol from INEOS Bio’s Vero Beach facility in 2014. The low end of the range accounts for the possibility of both an extended ramp-up period and interruptions to production continuing into 2014.

#### *KiOR*

KiOR is working to commercialize a technology capable of converting biomass to a biocrude using a process they call Biomass Fluid Catalytic Cracking (BFCC). BFCC uses a catalyst developed by KiOR in a process similar to Fluid Catalytic Cracking currently used in the petroleum industry. The first stage of this process produces a renewable crude oil which is then upgraded to produce primarily gasoline, diesel, and jet fuel as well as a small quantity of fuel oil, all of which are nearly identical to those produced from petroleum.

KiOR’s first commercial scale facility is located in Columbus, Mississippi and is capable of producing approximately 11 million gallons of gasoline, diesel, and jet fuel per year. Construction on this facility began in May 2011 and was completed in September 2012. This

facility is funded, in large part, with funds acquired through private equity raises and supplemented by KiOR's \$150 million IPO in June 2011. On March 17, 2013 KiOR generated their first cellulosic biofuel RINs from this facility. KiOR initially announced that they expected the start-up period at their Columbus facility to last 9-12 months, during which time they estimate fuel production will average 30%-50% of the facility capacity and production rates at or near nameplate capacity following. On August 8, 2013 KiOR reduced its production targets for 2013 from 3 - 5 million gallons to 1 - 2 million gallons. KiOR has feedstock supply agreements in place to supply all of the required feedstock for their Columbus facility with slash and pre-commercial thinning. They also have off-take agreements with several companies for all of the fuel that will be produced.

In today's proposal we are projecting a production range of 0 – 9 million ethanol-equivalent gallons in 2014 from KiOR's Columbus, MS facility. The high end of our proposed production projection (5.5 million actual gallons or 9 million ethanol-equivalent gallons) has been calculated assuming this facility produces at an average rate of 50% of nameplate capacity throughout 2014. We believe this reduced volume is appropriate given the low production volumes KiOR has achieved to date and KiOR's statements, in an August 8, 2013 conference call discussing their second quarter performance, that they had not yet begun focusing on increasing the efficiency and yields of the facility. The low end of the range (0 million gallons) reflects uncertainty surrounding KiOR's future production levels.

*LanzaTech*

LanzaTech has developed a process for the production of ethanol from feedstock streams that contain carbon monoxide. The LanzaTech process can utilize industrial waste gas streams or syngas produced from the gasification of agricultural residues, woody biomass, or other cellulosic feedstocks.<sup>11</sup> These gas streams are dispersed into a liquid medium where they are converted into ethanol or other chemicals by LanzaTech's proprietary microbes. LanzaTech is currently using this technology at two demonstration scale facilities in China, producing ethanol from waste gasses at steel mills in partnership with Baosteel and Capital Steel.

On January 3, 2012 LanzaTech purchased the former Range Fuels facility in Soperton, Georgia. LanzaTech is currently in the process of assessing the equipment in place at this facility. After making any necessary modifications to the existing gasifiers they plan to install units to allow for the production of ethanol from syngas produced from the gasification of local woody biomass. LanzaTech believes the current production capacity of the gasifiers when used in combination with their ethanol producing microbes is approximately 4 – 6 million gallons per year, with the potential for further expansion to allow for the production of 20 – 30 million gallons per year at this site. At this point, however, LanzaTech is not projecting initial ethanol production from this facility until late 2014 or early 2015. EPA has therefore not included any volume from LanzaTech in our cellulosic biofuel projections in this proposed rule.

*Poet*

---

<sup>11</sup> RIN generation would be limited to fuels produced using approved sources of biomass such as agricultural residue, tree residue from a tree plantation, or slash and pre-commercial thinnings. LanzaTech would be required to meet all recordkeeping and reporting requirements to demonstrate the feedstock is renewable biomass sourced from land that meets all of the land use requirements of the RFS program.

Poet has developed an enzymatic hydrolysis process to convert cellulosic biomass into ethanol. Poet has been investing in the development of cellulosic ethanol technology for more than a decade and began producing small volumes of cellulosic ethanol at pilot scale at their plant in Scotland, South Dakota in late 2008. In January 2012, Poet formed a joint venture with Royal DSM of the Netherlands, called Poet-DSM Advanced Biofuels, to commercialize and license their cellulosic ethanol technology.

The joint venture's first commercial scale facility, called Project LIBERTY, will be located in Emmetsburg, Iowa. This facility is designed to process 770 dry tons of corn cobs, leaves, husks, and some stalk per day into cellulosic ethanol. The facility is projected to have an annual production of approximately 25 million gallons per year. In anticipation of the start-up of this facility, Poet constructed a 22-acre biomass storage facility and had its first commercial harvest in 2010, collecting 56,000 tons of biomass.

Site prep work for Project LIBERTY began in the summer of 2011, and vertical construction of the facility began in the spring of 2012. Poet was awarded a \$105 million loan guarantee offer for this project from DOE in July 2011, but with the joint venture it decided to proceed without the loan guarantee. This project is expected to be completed in the first half of 2014 and will be followed by a commissioning period before the plant begins cellulosic ethanol production. Poet currently projects that production from Project LIBERTY will be between 7 and 12 million gallons of cellulosic ethanol in 2014. Using the six month best-case ramp-up period with production beginning on July 1, 2014 would result in a volume projection of 6 million gallons from this facility. In today's proposed rule, EPA is therefore setting the high end



of Poet's projected production range at 6 million gallons of cellulosic ethanol. The low end of the projected production range for Poet's Project LIBERTY is 0 gallons in 2014. This number reflects the fact that any significant delay in the start-up date or difficulties encountered in the commissioning or start-up phases of production are likely to result in little to no production from this facility in 2014. While EPA has no reason to believe this facility will be any more prone to these types of challenges than any other commercial scale cellulosic biofuel production facility, our experience suggests that these types of delays are common and should be considered when projecting the low end of the range for production volume in 2014.

### *Sweetwater Energy*

Sweetwater Energy has also developed a technology for converting cellulosic biomass, primarily agricultural residues and woody biomass, to cellulosic sugars. Sweetwater Energy uses a modular approach, building relatively small facilities near the source of feedstock and transporting the sugars they produce to a larger facility to be converted into renewable fuels or chemicals. They currently have two arrangements in place with corn ethanol facilities in the United States to provide cellulosic sugars in sufficient quantity for the production of 3.6 million gallons of cellulosic ethanol from each of these facilities. Both of Sweetwater Energy's cellulosic sugar production modules are scheduled to begin production in the summer of 2014. If both these facilities begin producing sugars that are converted to cellulosic biofuel on July 1, 2014, our best case scenario benchmark six month straight-line ramp-up period would project a volume of 2 million ethanol-equivalent gallons. At this time, however, cellulosic RINs would not be able to be generated for any fuel produced using Sweetwater Energy's cellulosic sugars

since the existing RFS registration regulations were not designed to allow the subdivision of processes between multiple facilities. Until this is resolved, fuel production processes of this type will not be able to generate RINs. We therefore have not included any volume from Sweetwater Energy in our projections of cellulosic biofuel for 2014.

### *Ensyn*

Ensyn has developed a technology called Rapid Thermal Processing (RTP) that uses heat to thermally crack carbon based feedstocks into a liquid bio-oil product they call renewable fuel oil (RFO). This conversion takes place in less than two seconds and is similar to the fluid catalytic cracking (FCC) process used in many refineries. Ensyn is currently using this technology in two commercial facilities located in Wisconsin and Ontario, Canada to produce renewable chemicals, food additives, and heating oil. They estimate that they have up to 3 million gallons of additional capacity at these two facilities that could be utilized if the fuel were eligible to generate RINs under the RFS program as home heating oil. This facility has a history of consistent production and we therefore believe this projection of 3 mill gal, or 5 million ethanol-equivalent gallons, is an appropriate number to use as the high end of the projected range.

Until recently the RFS regulations required that to qualify as “heating oil” for which RINs may be generated the fuel must be #1 diesel fuel, #2 diesel fuel, or any non-petroleum diesel blend that is sold for use in furnaces, boilers, and similar applications and which is commonly or commercially known or sold as heating oil, fuel oil, and similar trade names, and

that is not jet fuel, kerosene, or motor vehicle, nonroad, locomotive or marine diesel fuel (MVNRLM). On October 22, 2013, EPA finalized a rule to amend this definition to include:

A fuel oil that is used to heat interior spaces of homes or buildings to control ambient climate for human comfort. The fuel oil must be liquid at 60 degrees Fahrenheit and 1 atmosphere of pressure, and contain no more than 2.5% mass solids.<sup>12</sup>

This amendment allows the RFO produced by Ensyn to qualify for RINs if it were used to heat buildings where people live, work, recreate, or conduct other activities and it meets the other required components of the proposed definition. However, even if the fuel produced using the RTP process meets the new definition, Ensyn still faces several challenges to generating cellulosic biofuel RINs. Ensyn must still secure approved sources of renewable feedstock for their existing production facilities, increase production at these facilities, and find customers willing to make the modifications necessary to use Ensyn's RFO as home heating oil. Any of these steps could result in delays in the increased production or qualifying use of RFO until 2015. For this proposal EPA is projecting a range of production of 0 – 3 million gallons (0 – 5 million ethanol-equivalent gallons) from Ensyn's facilities in 2014. This volume has not been included in EPA's primary projection of cellulosic biofuel projection for 2014 due to the outstanding issues mentioned above, but has been considered in our projection of all potentially available cellulosic biofuel, including companies without existing pathways for generating cellulosic biofuel RINs. In light of the recent amendments to the home heating oil definition, EPA will review this projection and make adjustments as necessary in the final rule.

---

<sup>12</sup> 78 FR 62462.

## 2. Potential Domestic Producers without Existing Pathways

In addition to the facilities discussed above, there are a number of companies with the potential to produce cellulosic biofuel from domestic facilities in 2014 from pathways that have not been approved for RIN generation by EPA. Some of these pathways were addressed in a notice of proposed rulemaking published by EPA on June 14, 2013, while others are currently being evaluated by EPA. As the companies discussed in this section do not yet have approved RIN generating pathways for the fuels they plan to produce, there is additional uncertainty regarding RIN production from them in 2014.<sup>13</sup> Nevertheless, if the pathways are approved by EPA these facilities represent a significant potential source of cellulosic biofuel. The ranges projected for each company reflect only the uncertainty associated with production volumes, assuming pathway approval occurs.<sup>14</sup> EPA will decide whether or not to include any volume from these pathways based on the status of these pathways and the progress made by the companies towards commercial cellulosic biofuel production at the time of the final rule.

### *Compressed Natural Gas (CNG) and Liquified Natural Gas (LNG) Producers*

One of the new pathways proposed by EPA for the production of cellulosic biofuel is for the production of CNG or LNG from landfill biogas if used as a transportation fuel. The

---

<sup>13</sup> At the time of this proposal, EPA has finalized changes to the home heating oil definition but has not yet completed our determination of whether or not the fuels discussed in this section meet all of the requirements to generate cellulosic biofuel RINs.

<sup>14</sup> In projecting potential production volumes EPA has assumed that the pathways are all approved as of January 1, 2014. Approval subsequent to that date would reduce potential volumes, depending on the producer at issue.

production potential for this type of cellulosic biofuel is very large with many landfills currently capturing biogas. The use of CNG and LNG as a transportation fuel in 2014 is expected to be approximately 700 million ethanol-equivalent gallons.<sup>15</sup> To generate RINs for landfill biogas, however, companies must be able to demonstrate that any fuel for which they generate RINs is used as transportation fuel. This can be done by fueling vehicles with CNG/LNG onsite or through contractual mechanisms.

In this proposed rule, we are projecting a production range of 35-54 million ethanol-equivalent gallons from landfill biogas in 2014. The high end of the range represents the actual peak capacity of all of the facilities that produced advanced RINs from landfill biogas while the low end represents the current production rate of advanced biofuel from landfill biogas. In the case of CNG and LNG from landfill biogas, we believe a different methodology for projecting the high end of the production range is appropriate as the uncertainties surrounding RIN generation are significantly different. The only change at issue in the proposal to approve this pathway for the generation of cellulosic biofuel RINs is a change in the type of RIN that is generated, allowing for the generation of cellulosic biofuel instead of advanced biofuel RINs based on new information of the composition of the feedstock. In this case production facilities already exist and are already capturing landfill biogas at or near their registered capacities. Similarly, the amount of CNG and LNG currently being used as transportation fuel far exceeds the combined production capacity of all of the registered facilities. RIN generation is therefore limited by the companies' ability to demonstrate the use of the biogas as a transportation fuel.<sup>16</sup> As part of the registration process for the generation of advanced biofuel RINs, each of these

---

<sup>15</sup> EIA Annual Energy Outlook 2013. Transportation Sector Energy Use by Mode and Type, Reference case.

<sup>16</sup> See CFR 80.1426 for requirements for generating RINs from biogas

facilities submitted documentation that included contracts with parties capable of using CNG/LNG as transportation fuel who had access to the same common carrier pipeline network as the biofuel producers.

We believe the sum of the actual peak capacities of all of the facilities that produced advanced biofuel RINs from landfill biogas in 2013 is an appropriate volume to use for the high end of the projected production range. It is also the case, however, that these facilities would appear to have the capability to realize value from advanced RIN production if they were to produce at their facility capacity and are not currently doing so. There may be additional factors that EPA is unaware of at this time that is limiting production. To account for this, we are setting the low end of the range for the production of cellulosic RINs from CNG/LNG produced from landfills equal to 35 million gallons, the current production rate when projected over a full year.

#### *Edeniq*

Edeniq has developed a proprietary process that would allow corn ethanol producers to generate cellulosic ethanol from corn kernel fiber at the producers' existing production facilities. Their process involves the addition of the Cellunator™, a proprietary milling technology designed to increase the uniformity of the feedstock particles, along with a unique combination of enzymes to convert the cellulosic material in the corn kernel into sugars and ultimately cellulosic ethanol. Edeniq claims that their technology would not only allow corn ethanol producers to produce cellulosic ethanol from low value feedstock already present in their facility,

but also would increase the yields of ethanol produced from starch by 2-4%. Several commercial plants are currently using the Cellunator technology to increase their yields of ethanol from starch. Edeniq has been testing their technology, including both the Cellunator and the additional enzymes, at a demonstration scale facility in Visalia, California since June 2012 and announced in May 2013 that they had successfully completed a trial run at this facility with a continuous run time of greater than 1000 hours.

Several plants are evaluating Edeniq's proprietary system to produce cellulosic ethanol from corn kernel fiber. These evaluations have included commercial scale trials. If the pathway for the production of cellulosic ethanol from corn kernel fiber is approved, these facilities would be in position to begin generating cellulosic RINs shortly after approval. Other facilities currently using the Cellunator would only have to make minor modifications to their operations, including the addition of Edeniq's suite of enzymes to produce cellulosic ethanol. Edeniq currently projects approximately 7 million gallons of cellulosic ethanol production using their technology in 2014 and has provided EPA with detailed information on the expected production volumes and dates of initial cellulosic ethanol production for facilities expected to utilize their technology. In today's proposed rule, we have included a projected production volume of 0 – 7 million gallons. The low end of this range reflects the fact that Edeniq's technology has not yet been used to generate commercial scale volumes of cellulosic biofuel. The high end of the range reflects Edeniq's own projections, which EPA has reviewed and believes are reasonable given the nature of Edeniq's technology, the deals they currently have in place, and their experience with the installation and operation of the various components of their technology. This volume

is also dependent on the finalization of EPA's proposed rule clarifying that the definition of crop residue includes corn kernel fiber.

### 3. Potential Foreign Sources of Cellulosic Biofuel

In addition to the potential sources of cellulosic biofuel located in the United States discussed above there are several foreign cellulosic biofuel companies that may produce cellulosic biofuel in 2014. All of these facilities utilize fuel production pathways that have been approved by EPA for cellulosic RIN generation provided eligible sources of renewable feedstock are used. These companies would therefore be eligible to register these facilities under the RFS program and generate RINs for any fuel imported into the United States. Currently, however, none of these facilities have successfully completed the registration process for the RFS program. Further, demand for the cellulosic biofuels they produce is expected to be high in local markets. Production volumes from these foreign facilities have therefore not been included in our projection of potentially available volume for 2014. EPA plans to continue to monitor the progress of these foreign facilities and may include volumes from these facilities should their plans change in the future.

#### *Beta Renewables*

Beta Renewables has developed a biochemical technology to convert cellulosic biomass into cellulosic sugars, which can then be used in the production of fuels or chemicals. Their first



commercial scale facility was built in Crescentino, Italy and began producing cellulosic ethanol in commercial quantities in June 2013. This facility uses *Arundo donax* and wheat straw as feedstocks and has an annual production capacity of 20 million gallons of ethanol per year. Ethanol produced at this facility would be eligible to generate cellulosic RINs if Beta Renewables registers its facility and imports the cellulosic ethanol into the United States for use as a transportation fuel. Beta Renewables is also planning to build a cellulosic ethanol production facility in North Carolina. This facility is not expected to begin ethanol production in 2014, however, and has therefore not been included in our projection of available volume for 2014.

#### *Enerkem*

Enerkem plans to use a thermochemical process to produce syngas from MSW and other waste materials and then catalytically convert the syngas to methanol. The methanol can then be sold directly or upgraded to ethanol or other chemical products. Their first commercial scale facility in Edmonton, Alberta, Canada is scheduled to complete construction and begin producing methanol in 2013 with ethanol production following in 2014. At full capacity this facility will be capable of producing 10 million gallons of cellulosic ethanol per year. Despite their relative close proximity to the United States, Enerkem has indicated to EPA that they do not intend to export cellulosic biofuel into the United States from their Edmonton facility.

#### *GranBio*

GranBio began construction on its first commercial cellulosic ethanol production facility in São Miguel dos Campos, Brazil in December 2012. It is largely funded by a 300.3 million Reais loan from BNDES, Brazil's national social and economic development bank. This facility, which will use technology licensed from Beta Renewables, will have a nameplate capacity of 22 million gallons of ethanol per year and is scheduled to be completed in the first half of 2014. The feedstock for this facility will be excess bagasse not currently used to provide process heat or electricity at sugarcane ethanol production facilities.

#### *Raizen*

Raizen, a joint venture between Royal Dutch Shell and Cosan SA, is planning to build a 10.5 million gallon per year cellulosic ethanol plant attached to their Costa Pinto sugarcane mill in Piracicaba, Brazil. This facility will use a biochemical conversion technology developed by Iogen and Codexis to convert sugarcane bagasse to ethanol. The facility is currently scheduled to complete construction in the second half of 2014 and if successful will be the first of up to 8 cellulosic ethanol production facilities built by Raizen in Brazil.

#### 4. Summary of Volume Projections for Individual Companies

The information we have gathered on cellulosic biofuel producers, described above, allows us to project a range of production volumes for each facility in 2014. As in 2013, we have once again focused on commercial scale cellulosic biofuel production facilities. This focus

is appropriate, as the volume of cellulosic biofuel produced from R&D and pilot scale facilities is quite small in relation to that expected from the commercial scale facilities for which we have projected volumes in 2014 and historically R&D and demonstration scale facilities have not generated RINs for any fuel they have produced.

In 2014 as many as twelve domestic cellulosic biofuel production facilities have the potential to produce fuel at commercial scale. Each of these facilities is discussed above, and the projected available volumes for each are summarized in Table II.B.4-1 below. Two of the companies that have the potential to produce cellulosic biofuel in 2014, INEOS Bio and KiOR, are currently producing cellulosic biofuel. The production of RIN generating fuel from the remaining 10 facilities is more uncertain as these facilities have either yet to complete construction or do not currently have a valid pathway for generating cellulosic RINs.

We have also identified four foreign facilities with the potential to produce cellulosic ethanol in 2014. At this point we do not believe any of these facilities are likely to export any of the fuel they produce to the United States. We will continue to monitor the status of these facilities and may include volume from them in our final rule if appropriate. We ask for comment on this analysis and are especially interested in data that would support cellulosic volume estimates.

Table II.B.4-1

## Projected Available Cellulosic Biofuel for 2014

Company Name	Location	Feedstock	Fuel	Design Capacity (MGY) <sup>a</sup>	First Production	2014 Projected Available Volume (ethanol-equivalent)
Domestic Facilities; Approved Pathways						
Abengoa	Hugoton, KS	Corn Stover	Ethanol	24	1 <sup>st</sup> Quarter 2014	0 – 18
CoolPlanet Biofuels	TBD	TBD	Gasoline	10	2 <sup>nd</sup> Half 2014	0
DuPont	Nevada, IA	Corn Stover	Ethanol	30	2 <sup>nd</sup> Half 2014	0 – 2
Fiberight	Blairstown, IA	MSW	Ethanol	6	Unknown	0
INEOS Bio	Vero Beach, FL	Vegetative Waste	Ethanol	8	3 <sup>rd</sup> Quarter 2013	2 – 5
KiOR	Columbus, MS	Wood Waste	Gasoline and Diesel	11	1 <sup>st</sup> Quarter 2013	0 – 5.5 (0 – 9)
LanzaTech	Soperton, GA	Wood Waste	Ethanol	5	1 <sup>st</sup> Half 2015	0
Poet	Emmetsburg, IA	Corn Stover	Ethanol	25	1 <sup>st</sup> Half 2014	0 – 6

Sweetwater Energy	Various	Ag. Residue	Ethanol	7	1 <sup>st</sup> Half 2014	0
Domestic Facilities; All Potential Producers						
Ensyn	Stanley, WI	Wood Waste	Heating Oil	3	2007	0 – 3 (0 – 5)
CNG/LNG Producers	Various	Biogas from Landfills	CNG/ LNG	Various	N/A	35 – 54
Edeniq	Various	Corn Kernel Fiber	Ethanol	Various	1 <sup>st</sup> Half 2014	0 – 7
Foreign Facilities						
Beta Renewables	Crescentino, Italy	Wheat straw, Arundo Donax	Ethanol	20	2Q 2013	0
Enerkem	Edmonton, Alberta	Separated MSW	Methanol, Ethanol	10	1 <sup>st</sup> Half 2014	0
GranBio	São Miguel dos	Bagasse	Ethanol	22	1 <sup>st</sup> Half 2014	0

	Campos, Brazil					
Raizen	Piracicaba, Brazil	Bagasse	Ethanol	10.5	2 <sup>nd</sup> Half 2014	0

<sup>a</sup>Facilities are generally designed to process a given quantity of feedstock and volume capacities may vary depending on yield assumptions

### *C. Proposed Cellulosic Biofuel Volume for 2014*

As discussed in the preceding sections we have used information from a variety of sources, including EIA, USDA, and the companies themselves, to determine a projected range of production of cellulosic biofuel for each company in 2014. These volumes are summarized in Table II.B.4-1 above. These volumes form the basis for our projection of cellulosic biofuel production in 2014. We do not believe, however, that a simple summation of the low end and high end of the projected production volumes for each company would result in an appropriate projected range of production volumes across the cellulosic biofuel industry. It is highly unlikely that every company will produce at or near the low end, or conversely the high end, of its range of projected production volumes. It is also the case that the production expectations within the projected ranges differ for facilities in different stages. The uncertainties associated with cellulosic biofuel production vary in both type and degree among facilities that have already begun production, those that are currently in or will soon be approaching the commissioning of their facilities, and those that are still undergoing significant construction operations.

EPA is using a Monte Carlo simulation to account for the need to aggregate across several ranges, with different producers having different production probability distributions across their expected production range. As discussed above, the high and the low end of each range represents values such that it is possible but highly unlikely that volumes would be higher or lower than this range. EPA will therefore treat these individual ranges as representing the 90% confidence interval of a distribution of possible volumes. In other words, the low end of the range for a producer would represent the 5th percentile and the high end of the range would

represent the 95th percentile. This approach is consistent with EPA's judgment that, while the ranges shown in Table II.B.4-1 are intended to encompass the vast majority of possible volumes, there remains a small possibility that volumes outside of those ranges are possible. We believe it is reasonable to treat these values as a 90% confidence interval for purposes of the Monte Carlo analysis, though we request comment on treating them as a different confidence interval such as 80% or 95%.

For the purposes of the Monte Carlo analysis, EPA must also identify an uncertainty distribution for production for each facility. These distributions reflect our expectation for the most likely distribution of production volumes within the projected range when taking into account the many different uncertainties associated with the production volume from each facility. While each facility faces its own set of unique circumstances and challenges in producing cellulosic biofuels at commercial scale, many can be grouped into one of several general categories, the impact of which will vary with the progress achieved at that facility to date. One source of uncertainty in the projected production volume of a new cellulosic biofuel facility is related to the completion of the construction and commissioning phases of the facility. This includes uncertainty in the construction schedules, modifications to the design during the construction or commissioning phase, challenges encountered in scaling up the technology to commercial scale, unexpected delays or repairs due to weather events, or any of a number of other reasons. Delays of this type will result in a later than expected start-up date which may result in significantly decreased production volumes in 2014 or the start of production being delayed until 2015. The uncertainty related to delays in the completion of the construction of a



facility decreases the closer the project is to completion, and is entirely irrelevant to facilities that have already begun production.

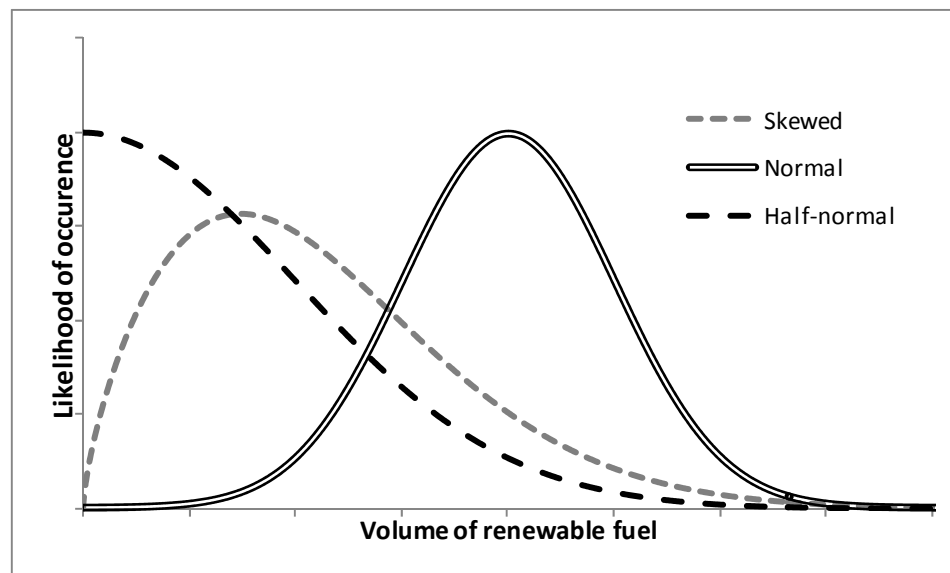
A second source of uncertainty is that associated with the ramp-up phase of new facilities. Lower than expected product yields, feedstock supply and handling challenges, contamination of chemical or biological catalysts, and a number of other issues can cause reduced production during the ramp-up phase and/or a longer than expected ramp-up period before reaching production levels that correspond to the nameplate capacity of the facility. Facilities that face these types of challenges during the ramp-up phase of production are very likely to still achieve some level of production, but that level may vary depending on the severity and duration of the challenges they face. The closer a facility is to achieving production rates that correspond to the nameplate capacity of the facility, the less likely they are to see reductions in their expected production due to challenges in the ramp-up phase.

A third source of uncertainty is the ability of the facility to maintain consistent production at or near nameplate capacity after the ramp-up phase has been successfully completed. A number of factors including, but not limited to feedstock supply interruption, significant issues with feedstock quality, loss of power or other essential utilities at the facility, and interruptions in production due to accidents, operator error, or weather events could cause fuel production at a facility to decrease or cease altogether. While the uncertainty associated with these issues is never completely absent, it does decrease over time if a facility is able to consistently achieve production levels at or near nameplate capacity with few or no interruptions to production.

The degree to which these three sources of uncertainty impact expected production of cellulosic biofuel in 2014 varies greatly with the progress achieved by the facility to date. To represent this uncertainty for facilities expected to begin operations in different timeframes, we used three different standardized uncertainty distributions. The three standard curves that represent the expected production distributions from cellulosic biofuel production facilities are shown in Figure II.C-1 below. We request comment on how well these three curves represent the expected production distributions of the various cellulosic biofuel producers discussed above or if other curves may be more appropriate.

Figure II.C-1

Standardized Distributions Used to Project Aggregate Cellulosic Biofuel Production<sup>a</sup>



<sup>a</sup> The skewed distribution is based on a Weibull distribution with a shape parameter of 0.5 and a scale parameter of 1.7.

As described more fully in Section IV.B.4, we believe that these three standardized distributions provide a mechanism for representing the regions within each projected volume range where the greatest likelihood of reasonably achievable volumes lie.

Facilities that have already begun producing cellulosic biofuel in 2012 or earlier and have at least a full year of production history do not face uncertainty associated with delays in the construction and commissioning of the facility. They may, however, face some uncertainty in their ramp-up schedule relative to the progress they have achieved to date, as well as the risk of unexpected shutdown or slowdown faced by all facilities. For facilities facing these uncertainties we expect that the most likely production volume is towards the middle of the range, with decreasing production probabilities as the high and low ends of the production ranges are approached. A normal curve is appropriate for this expected production distribution. In 2014, however, there are no commercial scale cellulosic biofuel production facilities that meet these criteria.

Facilities that began producing cellulosic biofuel in 2013 no longer face uncertainty due to potential delays in the completion of construction and the commissioning of the facility. There is, however, uncertainty regarding these facilities ramp-up schedules which can have a significant impact on the production volumes from these facilities. We believe that the expected production of these facilities would be best represented by a right-skewed or Weibull curve, with the most likely production volume near, but not at, the low end of the range and the production probabilities gradually towards the high end of the range.

Facilities not expected to begin producing cellulosic biofuel until 2014 face uncertainty associated with a delay in the completion in the construction and commissioning of the facility. Given this uncertainty, we believe that the most likely production volume is at the low end of the range with decreasing probability as the high end of the range is approached. To represent this asymmetrical uncertainty, we believe a half-normal curve is a reasonable representation of the expected production distribution from these facilities.

The type of uncertainty distribution used to represent the expected production within the projected range for each company is shown in Table II.C-1.

Table II.C-1

Standard Distributions Used to Project Cellulosic Biofuel Production in 2014

Company	Distribution Curve	5 <sup>th</sup> Percentile Volume (mill ethanol- equivalent gal)	95 <sup>th</sup> Percentile Volume (mill ethanol- equivalent gal)
Abengoa	Half-Normal	0	18
DuPont	Half-Normal	0	2
INEOS Bio	Right-Skewed	2	5
KiOR	Right-Skewed	0	9
Poet	Half-Normal	0	6
CNG/LNG Producers	Normal	35	54
Edeniq	Half-Normal	0	7
Ensyn	Normal	0	5

To aggregate the production distributions for each of the companies into a single distribution representing cellulosic biofuel production across the entire industry, we performed two Monte Carlo simulations in which each of the distributions was randomly sampled in an iterative fashion. Each of the distributions was sampled 3000 times and the results of all the iterations were then summed to produce a distribution for cellulosic biofuel. For the uncertainty distributions where the low end of the projected range was zero it was possible for the Monte Carlo simulation to select a negative volume for these companies.<sup>17</sup> Whenever negative volumes were selected in the Monte Carlo simulations these negative volumes were reset to zero.

We generated two separate aggregate distributions to represent total cellulosic biofuel using the Monte Carlo process. Given the uncertainty surrounding the timing and approval of the proposed RIN-generating pathways that would be used by CNG/LNG producers, Edeniq, and Ensyn, the first aggregate distribution only included volumes from those facilities using RIN-generating pathways that have already been approved. The result of this Monte Carlo simulation forms the basis for the range of cellulosic biofuel production included in this proposal.

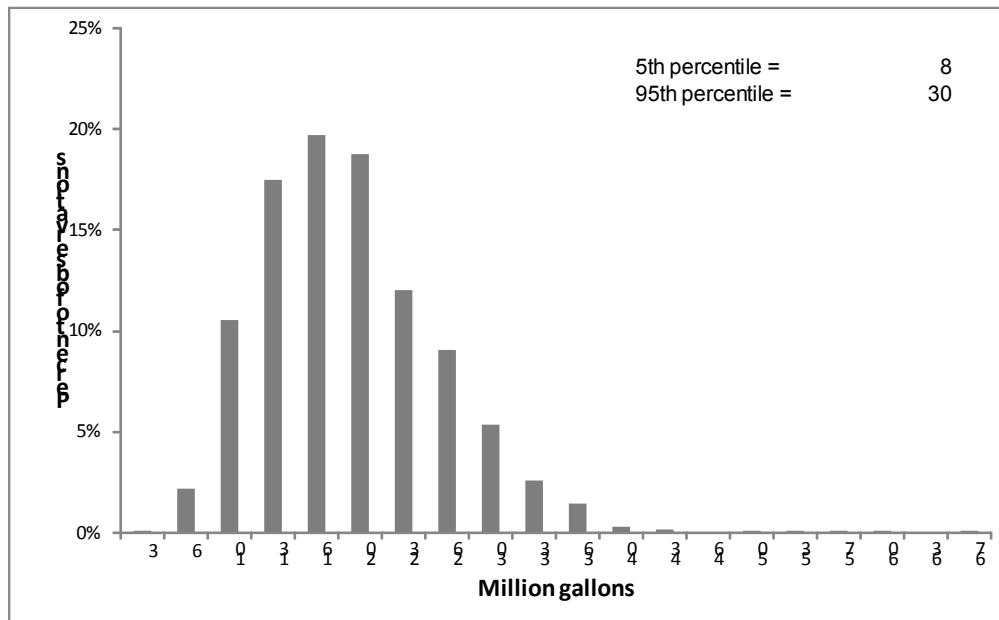
---

<sup>17</sup> Because the low end of each range represents the 5<sup>th</sup> percentile, negative volumes are selected approximately 5% of the time when the low end of the range is zero.

Figure II.C-2

Results of Monte Carlo Simulation for Cellulosic Biofuel Production

(Approved Pathways Only)

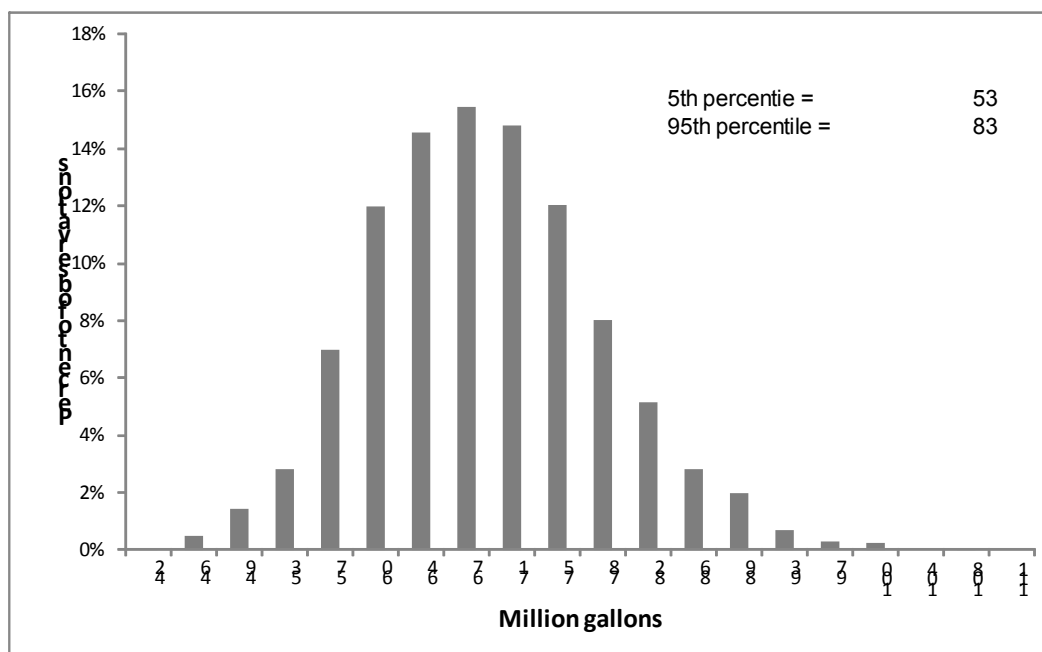


The second Monte Carlo simulation included volumes from all eight facilities for which we have projected a range of volumes in 2014. The results of this simulation would be more representative of the volume of cellulosic biofuel included in our final rule in the event that the proposed RIN-generating pathways discussed above are approved for RIN generation before the 2014 applicable volumes are finalized.

Figure II.C-3

# Results of Monte Carlo Simulation for Cellulosic Biofuel Production

(All Potential Cellulosic Biofuel Producers)



In today's NPRM we are proposing a volume for the 2014 cellulosic biofuel standard of 8 - 30 million ethanol-equivalent gallons. This volume is expected to be comprised of 5 - 26 million gallons of ethanol and 0 - 9 million ethanol-equivalent gallons of cellulosic hydrocarbons.<sup>18</sup> The proposed range is derived from the 90% confidence interval of the Monte Carlo simulation that includes all the companies we expect to produce commercial volumes of cellulosic biofuel in 2014 using pathways in the current RFS regulations. As discussed in Section II.B, many factors have been taken into consideration in developing the individual company projections, such as the information from EIA, the current status of project funding, the

<sup>18</sup> These volumes are also the result of our Monte Carlo simulation. Similar to the individual company production projections, the low and high ends of the ranges cannot be simply added together to calculate the high and low ends of our total cellulosic biofuel production projection in 2014. Cellulosic hydrocarbons include both cellulosic gasoline and cellulosic diesel.

status of the production facility, anticipated construction timelines, the anticipated start-up date and ramp-up schedule, feedstock supply, and many others. We have also used distribution curves weighted towards the low end of the expected production range for each company to account for the fact that previous projections of cellulosic biofuel production have exceeded actual production. We believe the range of volumes proposed (8 - 30 million ethanol-equivalent gallons) resulting from the Monte Carlo simulation is a reasonable representation of expected production in 2014 across the industry.

Our proposed range reflects EPA's best estimate of the range of cellulosic biofuel volumes that will actually be produced in 2014. In the final rule EPA will determine a single volume that represents EPA's best estimate of the volume that will actually be produced in 2014.<sup>19</sup> EPA invites comment on the best approach to determine a single value from a range developed using the approach described above. For example, EPA could use the mean (average value), median (50<sup>th</sup> percentile), or mode (the volume that occurs most frequently). It may also be reasonable to use a value representing higher or lower values in the distribution, such as the 25<sup>th</sup> or 75<sup>th</sup> percentile if there is reason to believe these would provide a more accurate projection of actual production in 2014.<sup>20</sup> We have determined the volumes represented by each of these methods and presented the values in Tables II.C-2 and II.C-3 below.

---

<sup>19</sup> See API v. EPA, 706 F.3d 474 (D.C. Cir. 2013).

<sup>20</sup> This could be the case if there was reason to believe there was a systematic bias such that the ranges tended to over or under estimate the actual production volumes.



Table II.C-2

Potential Approaches to Determining the Final Cellulosic Biofuel Requirement

(Approved Pathways Only)<sup>a</sup>

(million ethanol-equivalent gallons)

Mean	17
50th percentile	16
Mode	16
25 <sup>th</sup> percentile	12
75 <sup>th</sup> percentile	21

<sup>a</sup>All volumes are ethanol-equivalent gallons

Table II.C-3

Potential Approaches to Determining the Final Cellulosic Biofuel Requirement

(All Potential Cellulosic Biofuel Producers)<sup>a</sup>

(million ethanol-equivalent gallons)

Mean	67
50th percentile	67
Mode	67
25 <sup>th</sup> percentile	61
75 <sup>th</sup> percentile	73

<sup>a</sup>All volumes are ethanol-equivalent gallons

In today's NPRM, we are proposing to use the mean value for the final volume requirement for cellulosic because we believe it best represents a neutral aim at the volumes that could

reasonably be supplied. However, we request comment on whether one of the alternative values shown in Table II.C-2 would be more appropriate as the basis for the required volume of cellulosic biofuel in the final rule.

It is important to note that the final cellulosic biofuel standard for 2014 may be set at a volume outside the proposed range of 8 - 30 million ethanol-equivalent gallons. If EPA finalizes the pathways discussed in the recent proposed rulemaking<sup>21</sup> before the applicable volume of cellulosic biofuel for 2014 is finalized, volumes of fuel from companies intending to utilize these pathways may be included in our projected available volume for 2014 as discussed above. Foreign producers of cellulosic biofuel who inform EPA of their intent to export the fuel they produce to the United States may also be included. Finally, a variety of factors may affect our production projections for the companies considered in this proposal, including unexpected project modifications or cancellations or the inclusion of volumes of cellulosic biofuel from sources other than those listed above.

We will continue to monitor the progress of the cellulosic biofuel industry, in particular the progress of the companies which form the basis of our proposed 2014 volume projection. We expect that for the final rule there will be greater certainty on the appropriate volume of fuel that we can reasonably expect to be produced and made commercially available in 2014. We request comment on our analysis and estimates.<sup>22</sup>

---

<sup>21</sup> 78 FR 36042 (June 14, 2013).

<sup>22</sup> Since EPA is proposing to reduce the applicable volume of cellulosic biofuel under section 211(o)(7)(D), EPA will be required to make available cellulosic biofuel credits. EPA will set the price for the cellulosic biofuel credits in the final rule, using the same approach to applying the criteria in section 211(o)(7)(D)(ii) that was used in setting the price for cellulosic biofuel credits for 2013. See 78 FR 49794.

*D. Rescission of the 2011 Cellulosic Biofuel Standards*

On January 25, 2013, the United States Court of Appeals for the District of Columbia Circuit issued its decision concerning a challenge to the 2012 cellulosic biofuel standard. The Court found that in establishing the applicable volume of cellulosic biofuel for 2012, EPA had used a methodology in which “the risk of overestimation [was] set deliberately to outweigh the risk of underestimation.” The Court held EPA’s action to be inconsistent with the statute because EPA had failed to apply a “neutral methodology” aimed at providing a prediction of “what will actually happen,” as required by the statute. As a result of this ruling, the Court vacated the 2012 cellulosic biofuel standard, and we removed the 2012 requirement from the regulations in a previous action. Industry had also challenged the 2011 cellulosic biofuel standard by, first, filing a petition for reconsideration of that standard, and then seeking judicial review of our denial of the petition for reconsideration. This matter was still pending at the time of the D.C. Circuit’s ruling on the 2012 cellulosic biofuel standard. Since we used essentially the same methodology to develop the 2011 cellulosic biofuel standard as we did to develop the 2012 standard, we requested, and the Court granted, a partial voluntary remand to enable us to reconsider our denial of the petition for reconsideration of the 2011 cellulosic biofuel standard. Given the Court’s ruling that the methodology EPA used in developing the 2012 cellulosic biofuel standard was flawed, we have decided to grant reconsideration of the 2011 cellulosic biofuel standard, and are today proposing to rescind the 2011 cellulosic biofuel standard. If this proposal is finalized, the money paid by obligated parties to purchase cellulosic waiver credits to comply with the 2011 cellulosic biofuel standard would be refunded.

### **III. Proposed National Volume Requirement for Biomass-Based Diesel in 2014 and 2015**

EPA set the national volume requirement for biomass-based diesel for 2013 at 1.28 bill gal of biomass-based diesel.<sup>23</sup> This national volume is then used to determine the applicable percentage standard that determines the specific renewable volume obligations for refiners and importers. Subsequently, EPA received two Petitions for Reconsideration requesting that EPA reconsider the final rule setting the 2013 biomass-based diesel volume requirement at 1.28 bill gal.<sup>24</sup> After review and consideration of the issues raised by petitioners, EPA denied both petitions.<sup>25</sup>

In today's action we are proposing an applicable volume of 1.28 bill gal biomass-based diesel for 2014 and 2015. In proposing the 2015 applicable volume of biomass-based diesel, we are not at this time proposing the percentage standards that would apply to obligated parties in 2015. The percentage standards for 2015 will be proposed in a subsequent rulemaking as required by the statute once the requisite gasoline and diesel fuel volumes for 2015 are determined.

---

<sup>23</sup> 77 FR 59458 (September 27, 2012).

<sup>24</sup> Letter dated November 20, 2012 to Honorable Lisa Jackson from Richard Moskowitz, American Fuel & Petrochemical Manufacturers, "Re: Petition for Reconsideration – Docket No. EPA-HQ-OAR-2010-0133. Letter dated November 26, 2012 to Honorable Lisa Jackson from Robert L. Greco, III, American Petroleum Institute, "Re: Request for Reconsideration of EPA's Final Rulemaking "2013 biomass-Based Diesel Renewable Fuel Volume

<sup>25</sup> 78 FR 49411, August 14, 2013.

*A. Statutory Requirements*

Section 211(o)(2)(B)(i) of the Clean Air Act specifies the applicable volumes of renewable fuel on which the annual percentage standards must be based, unless the applicable volumes are waived or adjusted by EPA in accordance with the Act.<sup>26</sup> Applicable volumes are provided in the statute for years through 2022 for cellulosic biofuel, advanced biofuel, and total renewable fuel. For biomass-based diesel, applicable volumes are provided through 2012. For years after those specified in the statute (i.e. 2013+ for biomass-based diesel and 2023+ for all others), EPA is required under 211(o)(2)(B)(ii) to determine the applicable volume, in coordination with the Secretary of Energy and the Secretary of Agriculture, based on a review of the implementation of the program during calendar years for which the statute specifies the applicable volumes and on analysis of the following factors:

- The impact of the production and use of renewable fuels on the environment, including on air quality, climate change, conversion of wetlands, ecosystems, wildlife habitat, water quality, and water supply;
- The impact of renewable fuels on the energy security of the United States;
- The expected annual rate of future commercial production of renewable fuels, including advanced biofuels in each category (cellulosic biofuel and biomass-based diesel);
- The impact of renewable fuels on the infrastructure of the United States, including

---

<sup>26</sup> For example, EPA may waive a given standard in whole or in part following the provisions at CAA 211(o)(7).

deliverability of materials, goods, and products other than renewable fuel, and the sufficiency of infrastructure to deliver and use renewable fuel;

- The impact of the use of renewable fuels on the cost to consumers of transportation fuel and on the cost to transport goods; and
- The impact of the use of renewable fuels on other factors, including job creation, the price and supply of agricultural commodities, rural economic development, and food prices.

The statute also specifies that the applicable volume of biomass-based diesel cannot be less than the applicable volume for calendar year 2012, which is 1.0 bill gallons. The statute does not, however, establish any other numeric criteria or overarching goals for EPA to achieve in setting the applicable volumes in years after those specifically set forth in the provision.

Finally, the statute also specifies the timeframe within which these volumes must be promulgated: the applicable volumes must be established no later than 14 months before the first year for which such applicable volume will apply. We did not propose a 2014 volume for biomass-based diesel in the February 7, 2013 NPRM because at that time we were still evaluating the potential market impacts of current production levels. In order to provide sufficient time for this evaluation, we delayed our proposal for the 2014 volume requirement for biomass-based diesel. Consequently, today we are proposing volume requirements for both 2014 and 2015.

*B. Compliance with 2013 Volume Requirement of 1.28 Billion Gallons*

In making a determination regarding the volume requirement for biomass-based diesel to propose for 2014 and 2015, we first investigated the recent historical and current circumstances in the biodiesel market. According to data collected through the EPA-Moderated Transaction System (EMTS) production of biodiesel in 2012 exceeded 1.14 bill gal.<sup>27</sup> This demonstrates that the industry was able to meet the applicable 2012 volume requirement of 1 bill gal. It also provides evidence that the industry will meet the 1.28 bill gal requirement in 2013. Additional volumes above 1.28 bill gal are possible in 2013, and may be used to help meet the advanced biofuel standard. Indeed current production rates in the biodiesel industry for the first seven months of 2013 were 25% above monthly production rates for the same time period in 2012 and are consistent with a total production volume of at least 1.6 bill gal for 2013.<sup>28</sup>

While annual production volume has been increasing, a review of EIA's Monthly Biodiesel Production Reports<sup>29</sup> since 2009 indicates that there has been some variability both in monthly production volume and in the number of facilities producing that volume. For example,

---

<sup>27</sup> Fuels and Fuel Additives 2012 EMTS Data, <http://www.epa.gov/otaq/fuels/rfsdata/2012emts.htm> (last accessed September 16, 2013).

<sup>28</sup> Fuels and Fuel Additives 2013 EMTS Data, <http://www.epa.gov/otaq/fuels/rfsdata/2013emts.htm> (last accessed September 16, 2013).

<sup>29</sup> The U.S. Energy Information Administration as part of its responsibilities under section 1508 of the 2005 Energy Policy Act, amended its ICR and has begun collecting and publishing biodiesel production information on a monthly basis including production of biodiesel in a given month, the number of plants operating and contributing to the monthly total volume by state, and their total operating capacity for the year. U.S. Energy Information Administration/Monthly Biodiesel Production Report, Form EIA-22m Monthly Biodiesel Production Survey. U.S. Energy Information Administration, Monthly Biodiesel Production Report, For 2012 data collected showed that 2012 production was 969 mil gallons, which was up from production 967 million gallons during 2011.

there were significant biodiesel facility closures during the 2009 and 2010 calendar years. Since that time the overall number of biodiesel facilities in operation has stabilized and overall capacity in the biodiesel industry has remained stable from 2009-2012 at more than 2 bill gal. It is also clear that overall industry-wide utilization rates have increased during this time period from 25% in 2009 to approximately 46% in both 2011 and 2012. Thus it is clear that total production capacity at facilities already operating is above 1.28 bill gal. There are also indications that new or idle facilities have begun production in response to the 1.28 bill gal mandate for 2013. Specifically, EIA's monthly reports indicate that nine additional producers have become operational in the U.S. since the rule for 2013 biomass-based diesel was finalized.<sup>30</sup> The latest EIA monthly biodiesel report, available for July 2013, indicates that U.S. production was 128 million gallons in July, and came from 111 biodiesel plants in 38 states with total operating capacity of 2.1 bill gal per year.<sup>31</sup> As described in Section IV.B.2.b, total biodiesel production by the end of 2013 could be as high as 1.7 bill gal, and the facilities contributing to this production collectively have a capacity of well over 2 bill gal.

Further discussion of the factors we must consider in the context of the biomass-based diesel volume of 1.28 bill gallons for 2013 is contained in both the final rule adopting this level for 2013<sup>32</sup> and in EPA's denial of two petitions requesting the Agency reconsider the 2013 biomass-based diesel final rule.<sup>33</sup> As discussed in that final rule, the assessment of these factors supported a volume of 1.28 bill gallons for 2013. As we would expect that the impacts of 1.28

---

<sup>30</sup> EIA data indicates that in December 2011, after the close of the comment period, 103 biodiesel plants existed with an operating capacity of 2.1 bill gal per year. In March 2012, 104 biodiesel plants were operational and the report indicates that for the first quarter of 2012 production was up 78% over the first quarter of 2011. As EPA finalized the 2013 volume mandates in September 2012 there were 105 biodiesel producers operating in the U.S. By late November 2012 that number had increased to 112.

<sup>31</sup> <http://www.eia.gov/biofuels/biodiesel/production/> (last accessed September 16, 2013).

<sup>32</sup> 77 FR 59458 (September 27, 2012).

<sup>33</sup> 78 FR 49411, August 14, 2013.



bill gal in 2014 and 2015 would not be materially different, we are not repeating the discussion of those analyses here. However, we specifically request data and analyses suggesting that the factors we considered in 2013 have changed significantly for 2014 or 2015.

*C. Determination of Applicable Volume for 2014 and 2015*

The biodiesel industry has clearly demonstrated that it can produce the volumes of biomass-based diesel up to the minimum required by the statute, and that 1.28 bill gal of biodiesel is readily attainable. We have no real concerns that a level of 1.28 bill gal will be achieved effectively in 2013, and that once it is met this level of production and consumption can also be achieved in years after 2013. Production costs associated with 1.28 bill gal of biodiesel could be affected by various factors, including the expiration of the biodiesel tax credit and projected lower soy oil prices.

EPA's evaluation of the applicable volume that we should set for biomass-based diesel takes into account the context of the larger advanced biofuel and total renewable fuel volume requirements. The biomass-based diesel standard is a subset of both the advanced biofuel and total renewable fuel standards, and biomass-based diesel volumes can be used to meet all three standards. As discussed in Section IV below, we are proposing to reduce the applicable volumes of advanced biofuel and total renewable fuel. The reductions are designed to address several factors that affect achievement of the volume goals that Congress established in the statute for these categories of renewable fuel. These factors include limitations in production or

importation of the necessary volumes, and factors that limit supplying those volumes to the vehicles that can consume them. These same factors impact our consideration of the biomass-based diesel volume requirement for 2014. For example, EPA considers the availability of feedstocks for production of biodiesel.

More importantly, the production and use of biomass-based diesel can be supported by both the need to comply with the required volume for biomass-based diesel as well as the need to comply with the required volume for advanced biofuel or even the volume for total renewable fuel. This provides EPA additional flexibility in considering the appropriate national volume to set for the biomass-based diesel volume requirement, as this requirement is not the only mechanism in the RFS program that can support production and use of biomass-based diesel. For example, while the applicable volume that EPA sets for biomass-based diesel will ensure that at least that volume of biomass-based diesel would be produced and used, the advanced biofuel standard provides an alternative potential source of support for production and use of additional volumes of biomass-based diesel. It does this because obligated parties have discretion whether to choose biomass-based diesel or another advanced biofuel to satisfy their advanced biofuel obligation, and because the diesel pool can accommodate considerably more than 1.28 bill gal of biodiesel. EPA believes there is value in providing obligated parties increased flexibility in how they meet their required volume obligations in 2014. As discussed in Section IV, EPA is reducing the statutory volumes of advanced biofuel and total renewable fuel based on concerns of inadequate domestic supply of these renewable fuels. Providing obligated parties additional flexibility to address future supply circumstances is of increased importance under these circumstances.

In setting the applicable volume for biomass-based diesel for 2013, EPA discussed various impacts of requiring volumes of biomass-based diesel in light of the relevant factors to be considered under CAA section 211(o)(2)(B)(ii).<sup>34</sup> We believe this analysis continues to be appropriate, and supports the proposed applicable volume of biomass-based diesel for 2014. In considering all of these factors, we see no need to reduce the minimum biomass-based diesel volume requirement from 2013 levels. We have a high degree of confidence that this volume of 1.28 bill gal could be achieved effectively without any real risk of production or supply problems.

At the same time, as discussed above, the volume requirement for biomass-based diesel is nested within the advance biofuel standards that we are proposing to reduce in 2014. We believe that volumes of biomass-based diesel above 1.28 bill gal can, and likely will, be produced in 2014 to meet the requirements of the advanced biofuel standard, though the degree to which this occurs will also depend on whether the biodiesel tax subsidy is extended beyond December 31, 2013. We do not expect that there would be a significant difference between additional volumes of biomass-based diesel above 1.28 bill gal and other advanced biofuels, as far as the overall impact of those fuels in terms of the factors we are required to consider under section 211(o)(2)(B)(ii). Any such differences would also be hard to quantify. At the same time, providing obligated parties the discretion to choose the method to comply with their advanced biofuel volume requirement most appropriate for their circumstances is likely to reflect the most effective or efficient way to achieve the advanced biofuel volume requirements given the market circumstances present in 2014. In addition, as noted above, providing obligated parties

---

<sup>34</sup> 77 FR 59458 (September 27, 2012), especially Sections IV and V of the preamble.

additional flexibility to address the 2014 supply circumstances is of increased importance under the circumstances surrounding supply and consumption as discussed in Section IV. Therefore we are not proposing to increase the volume of biomass-based diesel that will be required in 2014 and 2015.<sup>35</sup>

We invite comment on any different approaches that might be appropriate for balancing the factors noted above, including requiring an increase in the minimum volume of biomass-based diesel above 1.28 bill gal in both 2014 and 2015. As discussed above, volumes above 1.28 bill gal should be available, whether to meet a minimum biomass-based diesel requirement or the advanced biofuel requirement. Requiring a minimum volume of biomass-based diesel greater than 1.28 bill gal would place less emphasis on the benefits of preserving flexibility in how the required volume of advanced biofuel is achieved, and more emphasis on production of biomass-based diesel, without specific regard to the existence of a tax subsidy or to potential supplies of carryover biomass-based diesel RINs generated in 2013. We invite comment on all aspects of this issue, including information related to the statutory factors that we must consider as described in Section III.A. We also invite comment on the extent to which carryover biomass-based diesel RINs from 2013 would affect production levels of biomass-based diesel or other advanced biofuels in 2014, whether to meet the 1.28 bill gal biomass-based diesel volume or to achieve higher levels as a part of achieving the advanced biofuel requirement. We also seek comment on how EPA should take such information on biomass-based diesel carryover RINs into account when setting these volume requirements and the degree to which those carryover

---

<sup>35</sup> While the statute requires EPA to establish the applicable volume of cellulosic biofuel at projected production levels, this is not the case with respect to the applicable volume of biomass-based diesel. For biomass based-diesel, EPA may set the applicable volume at any level above 1 bill gal after consideration of the factors set forth in the statute and consultation with the Departments of Agriculture and Energy.

RINs support the goal of maintaining flexibility in how obligated parties meet the advanced biofuel mandate.

In the overall context of the RFS program, the level of the biomass-based diesel applicable volume can be seen as the minimum amount of biomass-based diesel that is required, recognizing that additional volumes of biomass-based diesel may be used, along with other advanced biofuels, to satisfy the volume requirements for advanced biofuel and total renewable fuel. Having considered the statutory factors, in the context of proposing the volume requirements for advanced biofuel and total renewable fuel, we believe the minimum required volume of biomass-based diesel should be set at the same level as 2013. This approach would also recognize that volumes of biomass-based diesel could be produced and consumed above the required volume level, and that obligated parties could well choose to use more biomass-based diesel than is required to satisfy their volume obligations for advanced and total renewable fuel. A volume requirement of 1.28 bill gal for biomass-based diesel in 2014 and 2015 would provide an assured minimum volume level for biomass-based diesel while also providing a clear opportunity for greater growth as part of the advanced biofuel category. Greater use of biomass-based diesel would be a recognized compliance path for the advanced and total renewable fuel volume obligations being proposed today. The proposed levels of those standards provide a significant opportunity for greater volumes of biomass-based diesel to be produced and used if the market chooses them. We request comment on this proposed approach to the biomass-based diesel volume requirement for 2014 and 2015.

#### **IV. Proposed National Volume Requirements for Advanced Biofuel and Total Renewable Fuel for 2014**

As described in Section I, the national volumes of renewable fuel to be used under the RFS program each year are specified in CAA 211(o)(2). For 2014, the applicable volume of advanced biofuel is 3.75 bill gal and the applicable volume of total renewable fuel is 18.15 bill gal. However, two statutory provisions authorize EPA to reduce these volumes. EPA may reduce these volumes if it reduces the applicable volume for cellulosic biofuel, or if the criteria are met under the general waiver authority.<sup>36</sup> We are proposing to exercise our discretion under these provisions to reduce the applicable volumes of advanced biofuel and total renewable fuel to address several factors that affect achievement of the volume goals that Congress established in the statute. These factors include limitations in production or importation of the necessary volumes, and factors that limit supplying those volumes to the vehicles that can consume them. Based on a detailed analysis of these limitations, we are proposing reductions in the statutory volumes of both advanced biofuel and total renewable fuel as shown below.

---

<sup>36</sup> See CAA section 211(o)(7)(D) and (A)

Table IV-1

## Proposed Volumes for 2014 (billion gallons)

	Statutory volume	Proposed volume	
		Range	Mean
Advanced biofuel	3.75	2.00 - 2.51	2.20
Total renewable fuel	18.15	15.00 - 15.52	15.21

We are proposing to use a combination of the cellulosic biofuel waiver authority and the general waiver authority to ensure that the proposed volumes are reasonably achievable given limitations in the volume of ethanol that can be practically consumed in motor vehicles considering constraints on the supply of higher ethanol blends to the vehicles that can use them and other limits on ethanol blend levels approved for use in motor vehicles and the volume of non-ethanol renewable fuels that we expect would be reasonably achievable. To accomplish this, we are proposing an approach involving the following three steps:

- First, we would determine the total volume of ethanol that can reasonably be supplied to and consumed in the transportation sector as both E10 and higher ethanol blends such as E85. We would then add to this the volume of all non-ethanol biofuels that we expect could be reasonably available for meeting all four of the applicable volume requirements (cellulosic biofuel, biomass-based diesel, advanced biofuel, and total renewable fuel). This first step would determine the volume of renewable fuel that can adequately be produced and supplied to consumers in light of limitations on the

consumption of ethanol (commonly referred to as the “ethanol blendwall”) and other relevant constraints, and would form the basis for the required volume of total renewable fuel as adjusted pursuant to EPA’s waiver authorities.

- Second, we would determine the volumes of all sources of advanced biofuel that could be reasonably achieved to ensure that the required volume of advanced biofuel be set no higher than the volume that is projected to be reasonably available.
- Third, we would determine an appropriate volume of advanced biofuel at or below the projected available volume determined in the second step. This volume would include the required volume of cellulosic biofuels and biomass-based diesel, which are set separately, as well as any additional volumes of non-ethanol advanced biofuels projected to be reasonably achievable. This approach would account for the contribution of ethanol volumes in the advanced biofuel category to the supply concerns related to total renewable fuel, including considerations of both production and consumption. While ensuring that both advanced biofuel and non-advanced renewable fuels play a role in addressing the ethanol blendwall, it would also support Congress's goal in the RFS program of continued growth in the advanced biofuel category as reflected in the volume requirements established in the statute. As discussed in detail in Section IV.C.2, we have examined several alternative approaches to this third step, but we believe this approach best accommodates the objectives of the RFS program, while accounting for the limitations in the ability to



produce and consume renewable fuels. We request comment, however, on alternative approaches and on all aspects of the framework discussed in this section.

We anticipate that the framework described in this section would apply not only to 2014, but to subsequent years as well. The specific estimates of volumes for each potential source of renewable fuel would be different in each future year, but the manner in which we aggregate those estimates to determine appropriate volume requirements would follow the overall approach described above. If circumstances differ substantially from those described here, or if further analysis suggests that our proposed approach is inadequate, we may consider the need for additional measures.

***A. Statutory Authorities for Reducing Volumes to Address Biofuel Availability and the Ethanol Blendwall***

In establishing the annual volume objectives in the statute, Congress intended that volumes of renewable fuel, advanced biofuel, and cellulosic biofuel increase every year through 2022, and that volumes of biomass-based diesel be at least equal to the statutory volume for 2012, while granting EPA discretion to increase the biomass-based diesel volume based on consideration of several specified factors. However, Congress recognized that circumstances could arise that might require a reduction in the volume objectives specified in the statute as evidenced by the different waiver provisions in CAA 211(o)(7). As described in more detail below, we believe that limitations in production or importation of qualifying renewable fuels,

and factors that limit supplying those volumes to the vehicles that can consume them, both constitute circumstances that warrant a waiver under section 211(o)(7) as discussed below. With regard to the ethanol blendwall, a decrease in total gasoline consumption since EISA was enacted in 2007, coupled with limitations in the number and geographic distribution of retail stations that offer higher ethanol blends such as E85 and the number of FFVs that have access to E85, as well as other market factors, combine to place significant restrictions on the volume of ethanol that can be supplied to and consumed in the transportation sector. Based on the types of renewable fuel that we project are likely to be available in 2014 and the volume that is likely to be non-ethanol, we believe that the ethanol blendwall represents a circumstance that warrants a reduction in the mandated volumes for 2014.

The statute provides two separate authorities that permit EPA to reduce volumes of advanced biofuel or total renewable fuel under certain conditions: the cellulosic waiver authority and the general waiver authority. Applying a combination of these two authorities is the most appropriate way to address limitations in production or importation of the necessary volumes, and factors that limit supplying those volumes to the vehicles that can consume them, including the ethanol blendwall. This section discusses both of these statutory authorities and the manner in which we believe they can be used together to set standards for 2014.

1. Cellulosic Waiver Authority

Under CAA section 211(o)(7)(D)(i), if EPA determines that the projected volume of cellulosic biofuel production for the following year is less than the applicable volume provided in the statute, then EPA must reduce the applicable volume of cellulosic biofuel to the projected volume available during that calendar year. Under such circumstances, EPA also has the discretion to reduce the applicable volumes of advanced biofuel and total renewable fuel by an amount not to exceed the reduction in cellulosic biofuel.

Section 211(o)(7)(D)(i) provides that “[f]or any calendar year in which the Administrator makes such a reduction, the Administrator may also reduce the applicable volume of renewable fuel and advanced biofuels requirement established under paragraph (2)(B) by the same or a lesser volume.” Thus Congress authorized EPA to reduce the volume of total renewable fuel and advanced biofuel. As EPA has discussed before, this indicates a clear Congressional intention that under this provision EPA may reduce both the total renewable and advanced biofuel volume together, not one or the other.

As described in the May 26, 2009 NPRM for the RFS regulations, we do not believe it would be appropriate to lower the advanced biofuel standard but not the total renewable standard, as doing so would allow conventional biofuels to effectively be used to meet the standards that Congress specifically set for advanced biofuels.<sup>37</sup> EPA interprets this provision as authorizing EPA to reduce both total renewable fuel and advanced biofuel, by the same amounts, if EPA reduces the volume of cellulosic biofuel. Using this authority the reductions in total renewable fuel and advanced biofuel can be up to but no more than the amount of reduction in

---

<sup>37</sup> See 74 FR 24914-15

the cellulosic biofuel volume. Further discussion of this provision can be found in the final rule establishing the 2013 RFS standards.<sup>38</sup>

The statute does not provide any explicit criteria that must be met or factors that must be considered when making a determination as to whether and to what degree to reduce the advanced biofuel and total renewable fuel applicable volumes based on a reduction in cellulosic biofuel volumes under CAA section 211(o)(7)(D)(i). EPA can consider the criteria described in sections 211(o)(2)(B)(ii) and 211(o)(7)(A) in determining appropriate reductions in advanced biofuel and total renewable fuel under the cellulosic waiver authority at section 211(o)(7)(D)(ii), or any other factors that may be relevant. However, EPA must provide a reasoned explanation for any decision to reduce the advanced biofuel and total renewable fuel volume requirements under the cellulosic biofuel waiver authority.

## 2. General Waiver Authority

CAA 211(o)(7)(A) provides that EPA, in consultation with the Secretary of Agriculture (USDA) and the Secretary of Energy (DOE), may waive the applicable volume requirements of the Act in whole or in part based on a petition by one or more States, by any person subject to the requirements of the Act, or by the EPA Administrator on her own motion. Such a waiver must be based on a determination by the Administrator, after public notice and opportunity for comment, that:

---

<sup>38</sup> 78 FR 49794, August 15, 2013.

- Implementation of the requirement would severely harm the economy or the environment of a State, a region, or the United States; or
- There is an inadequate domestic supply.

In today's NPRM, we are proposing to use the general waiver authority to waive the applicable volume requirements based on the statute's authorization for the Administrator to act on her own motion. We have initiated discussions with both USDA and DOE on the proposed approach to determining the applicable volume requirements that is described in this section.

Because this provision provides EPA the discretion to waive the volume requirements of the Act "in whole or in part," we interpret this section as granting authority to waive any or all of the four applicable volume requirements in appropriate circumstances. Thus, for example, unlike the cellulosic waiver authority, a reduction in total renewable fuel pursuant to the general waiver authority would not automatically result in the same reduction in advanced biofuel, and would not be limited by the reduction in cellulosic biofuel.

EPA has not previously interpreted or applied the waiver provision in CAA section 211(o)(7)(A)(ii) related to "inadequate domestic supply."<sup>39</sup> As explained in greater detail below, we believe that this ambiguous provision is reasonably and best interpreted to encompass the full range of constraints that could result in an inadequate supply of renewable fuel to the ultimate consumers, including fuel infrastructure and other constraints. This would include, for instance,

---

<sup>39</sup> EPA has applied the waiver provision in section 211(o)(7)(A)(i) related to severe harm to the economy. See 77 FR 70752 (November 27, 2012), 73 FR 47168 (August 13, 2008).

factors affecting the ability to produce or import qualifying renewable fuels as well as factors affecting the ability to distribute, blend, dispense, and consume those renewable fuels.

The waiver provision at CAA 211(o)(7)(A)(ii) is ambiguous in several respects. First, it does not specify what the general term "supply" refers to. The common understanding of this term is an amount of a resource or product that is available for use by the person or place at issue.<sup>40</sup> Hence the evaluation of the supply of renewable fuel, a product, is best understood in terms of the person or place using the product. In the RFS program, various parties interact across several industries to drive the ultimate use of renewable fuel by consumers of transportation fuel. For example, supplying renewable fuel to obligated parties and terminal blenders is one part of this process, while supplying renewable fuel to the ultimate consumer as part of transportation fuel is a different and later aspect of this process. This is clearly the case with respect to the renewable fuels ethanol and biodiesel, which are typically supplied to the obligated parties and terminals as a neat fuel, but in almost all cases are supplied to the consumer as a blend with conventional fuel (ethanol and gasoline or biodiesel and diesel). The waiver provision does not specify what product is at issue (for example, neat renewable fuel or blended renewable fuel with transportation fuel) or the person or place at issue (for example, obligated party or ultimate consumer), in determining whether there is an "inadequate domestic supply."

The waiver provision also does not specify what factors are relevant in determining the adequacy of the supply. Adequacy of the supply would logically be seen in terms of the parties

---

<sup>40</sup> For example, see [http://oxforddictionaries.com/us/definition/american\\_english/supply](http://oxforddictionaries.com/us/definition/american_english/supply) (a stock of a resource from which a person or place can be provided with the necessary amount of that resource: "*There were fears that the drought would limit the exhibition's water supply.*"); <http://www.macmillandictionary.com/us/dictionary/american/supply> ("A limited oil supply has made gas prices rise." and "Aquarium fish need a constant supply of oxygen.").

who use the supply of renewable fuel. Adequacy of supply could affect various parties, including obligated parties, terminal operators, and consumers. Adequacy of supply with respect to the consumer might well involve consideration of factors different from those involved when considering adequacy of supply to the obligated parties. We believe that interpreting this waiver provision as authorizing EPA to consider the adequacy of supply of renewable fuel to all of the relevant parties, including the adequacy of supply to the ultimate consumer of transportation fuel, is consistent with the common understanding of the terms used in this waiver provision, especially in the context of a fuel program that is aimed at increasing the use of renewable fuel by consumers. In our view, this is the most reasonable and appropriate construction of this ambiguous language in light of the overall policy goals of the RFS program.

EPA has reviewed other fuel related provisions of the Clean Air Act with somewhat similar waiver provisions, and they highlight both the ambiguity of the RFS general waiver provision and the reasonableness of applying it broadly to include adequacy of supply to the ultimate consumer of transportation fuel. For example, CAA section 211(k)(6)(A)(ii) allows EPA to defer application of reformulated gasoline (RFG) requirements in a state that opts in to the RFG program if EPA determines that "there is insufficient domestic capacity to produce reformulated gasoline." A related RFG waiver provision concerning the application of RFG requirements in the Ozone Transport Region, section 211(k)(6)(B)(i) and (iii), provides for a waiver of RFG requirements based on "insufficient capacity to supply reformulated gasoline." For these RFG waiver provisions, Congress more clearly and explicitly indicated that the capacity to supply RFG could include consideration of factors beyond those concerning the capacity to produce RFG. In the language of the RFS general waiver provision, in comparison,

Congress used a single, broader and clearly ambiguous phrase - "inadequate domestic supply" - without elaboration or clarification as to whether it refers solely to production capacity or also includes additional factors relevant to the ability to supply the fuel to various persons such as the ultimate consumer. As in the RFG provision, however, the adequacy of supply referred to in the RFS general waiver provision can logically - and we believe should - be read to include factors beyond capacity to produce that impact the ability of consumers to use the fuel as a transportation fuel.

CAA section 211(c)(4)(C)(ii) provides EPA with waiver authority to address "extreme and unusual fuel or fuel additive supply circumstances ... which prevent the distribution of an adequate supply of the fuel or fuel additive to consumers." The supply circumstances must be the result of a natural disaster, an Act of God, a pipeline or refinery equipment failure or another event that could not reasonably have been foreseen, and granting the waiver must be "in the public interest." In this case, Congress clearly specified that the adequacy of the supply is judged in terms of the availability of the fuel for use by the ultimate consumer, and includes consideration of the ability to distribute the required fuel or fuel additive to the ultimate consumer. Although the RFS waiver provision does not contain any such explicit clarification from Congress, its broad and ambiguous wording provides EPA the discretion to reasonably interpret the scope of the RFS waiver provision. EPA's interpretation of the RFS waiver provision is consistent with the view, expressed more explicitly in the section 211(c) waiver, that the adequacy of the supply of a fuel or fuel additive can reasonably be judged in terms of availability for use by the consumer, and can include consideration of the capacity to distribute the product to the ultimate consumer.



CAA section 211(m)(3)(C) allows EPA to delay the effective date of oxygenated gasoline requirements for certain carbon monoxide nonattainment areas if EPA finds "an inadequate domestic supply of, or distribution capacity for, oxygenated gasoline . . . or fuel additives" needed to make oxygenated gasoline. Here, Congress chose to expressly differentiate between "domestic supply" and "distribution capacity," indicating that each of these elements was to be considered separately. This would indicate that the term inadequate supply, although ambiguous for the reasons discussed above, could in appropriate circumstances be read as more limited in scope. In contrast to the RFS waiver provision, the section 211(m) waiver provision includes additional text that makes clear that EPA's authority includes consideration of distribution capacity - reducing the ambiguity inherent in using just the general phrase "inadequate domestic supply." Presumably this avoids a situation where ambiguity would result in an overly narrow administrative interpretation. The oxygenated gasoline waiver provision is also instructive in that it clarifies that it applies separately to both finished oxygenated fuel and to oxygenated fuel blending components. That is, there could be an adequate supply of the oxygenate, such as ethanol, but not an adequate supply of the blended fuel which is sold to the consumer. The RFS waiver provision employs the phrase "inadequate domestic supply" without further specification or clarification, thus providing EPA the discretion to determine whether the adequacy of the supply of renewable fuel can reasonably be judged in terms of availability for use by the ultimate consumer, including consideration of the capacity to distribute the product to the ultimate consumer. In contrast to the section 211(m) waiver provision, Congress arguably did not mandate that the RFS waiver provision be interpreted as providing authority to address problems affecting the supply of renewable fuel to the ultimate consumer. However, the RFS waiver

provision does provide EPA the discretion to adopt such an interpretation, resulting in a policy approach consistent with that required by the less ambiguous section 211(m) waiver provision.<sup>41</sup>

As the above review of various waiver provisions in Title II of the Clean Air Act makes clear, Congress has used the terms "supply" and "inadequate supply" in different waiver provisions. In the RFS general waiver provision, Congress spoke in general terms and did not address the scope of activities or persons or places that are the focus in determining the adequacy of supply. In other cases, Congress provided, to varying degrees, more explicit direction. Overall, the various waiver provisions lend support to the view that it is appropriate, where Congress has used just the ambiguous phrase "inadequate domestic supply" in the general waiver provision, to consider supply in terms of distribution and use by the ultimate consumer, and that the term "inadequate supply" of a fuel need not be read as referring to just the capacity to produce renewable fuel or the capacity to supply it to the obligated parties.

We are aware that prior to final adoption of the Energy Independence and Security Act of 2007, Congress had before it bills that would have provided for an EPA waiver in situations where there was "inadequate domestic supply or distribution capacity to meet the requirement."<sup>42</sup> EPA is not aware of any conference or committee reports, or other legislative history, explaining why Congress ultimately enacted the language in EISA in lieu of this alternative formulation. There is no discussion, for example, of whether Congress did or did not want EPA to consider

---

<sup>41</sup> In CAA section 211(h)(5)(C)(ii), Congress authorized EPA to delay the effective date of certain changes to the federal requirements for Reid vapor pressure in summertime gasoline, if the changes would result in an "insufficient supply of gasoline" in the affected area. As with the RFS general waiver provision, Congress did not specify what considerations would warrant a determination of insufficient supply. EPA has not been called upon to apply this provision to date and has not interpreted it.

<sup>42</sup> H.R. 6 and S. 606 as reported by Senate Env't. & Public Works in Senate Report 109-74

distribution capacity, whether Congress believed the phrase "inadequate domestic supply" was sufficiently broad that a reference to distribution capacity would be unnecessary or superfluous, or whether Congress considered the alternative language as too limiting, since it might suggest that other types of constraints on delivering renewable fuel to the ultimate consumer should not be considered for purposes of granting a waiver.<sup>43</sup> Given the lack of interpretive value typically given to a failure to adopt a legislative provision, and the lack of explanation in this case, we find the legislative history to be uninformative with regard to Congressional intent on this issue. It does not change the fact that the text adopted by Congress, whether viewed by itself or in the context of other fuel waiver provisions, is clearly ambiguous.

We believe the term "inadequate domestic supply" should be interpreted to authorize EPA to consider the full range of constraints, including fuel infrastructure and other constraints, that could result in an inadequate supply of renewable fuels to consumers. Under this interpretation, we would not limit ourselves to consideration of the capacity to produce or import renewable fuels but would also consider practical and other constraints related to the fuel delivery infrastructure and their effect on the volume of qualifying renewable fuel that would be supplied to the ultimate consumer.

This interpretation is consistent with the provisions of section 211(o) and promotes Congress's purposes in establishing the RFS program, which are to ensure that certain volumes of renewable fuel are used by the ultimate consumer as a replacement for the use of fossil based

---

<sup>43</sup> There are, for example, legal constraints on the amount of certain renewable fuels that may be blended into transportation fuels.

transportation fuel.<sup>44</sup> The RFS program does not achieve the desired benefits unless renewable fuels are actually used to replace fossil based transportation fuels. For example, the greenhouse gas reductions and energy security benefits that Congress sought to promote through this program are realized only through the use by consumers of renewable fuels that reduce or replace fossil fuels present in transportation fuel. Imposing RFS volume requirements on obligated parties without consideration of the ability of the obligated parties and other parties to deliver the renewable fuel to the ultimate consumers, would achieve no such benefits and would fail to account for the complexities of the fuel system that delivers transportation fuel to consumers. We do not believe it would be appropriate to interpret the RFS general waiver provision more narrowly and limit EPA's consideration of factors related to the distribution and use of renewable fuels by the ultimate consumers of these fuels.

We invite comment on all aspects of our proposed interpretation of the waiver provision based on "inadequate domestic supply." Whether or not circumstances projected for 2014 justify a waiver on this basis is discussed in Sections IV.B and IV.C.

---

<sup>44</sup> See CAA section 211(o)(1)(I) (renewable fuel defined as “fuel ... used to replace or reduce the quantity of fossil fuel present in a transportation fuel”), section 211(o)(2)(A)(i) (EPA’s regulations must “ensure that transportation fuel sold or introduced into commerce in the United States ... contains at least the applicable volume of [renewable fuels]”). Also see CAA section 211(o)(1)(A), definition of “additional renewable fuel.” As one example, in the RFS program fuels with multiple end uses such as biogas or electricity are not considered a renewable fuel absent a demonstration that they will be used by the ultimate consumers as transportation fuel. As noted above, ethanol is almost always used as a renewable fuel in the form of E10 or higher, not as neat ethanol. The supply of neat ethanol, or biogas or electricity, does not by itself determine the supply of the fuel ethanol used as a transportation fuel.

### 3. Combining Authorities for Reductions in Advanced Biofuel and Total Renewable Fuel

The two primary drivers that we have considered in today's NPRM for reductions in the required volumes are limitations in the availability of qualifying renewable fuels and factors that constrain supplying those volumes to the vehicles that can consume them. These two drivers are both relevant forms of inadequate domestic supply, which authorize reductions under the general waiver authority and can also justify reductions under the cellulosic biofuel waiver authority. We believe that reducing both total renewable and advanced biofuel are appropriate responses to these circumstances, and we propose to use a combination of the two waiver authorities discussed above to achieve this result as neither authority independently is sufficient to justify the necessary volume reductions. As discussed in Section II, EPA is proposing to reduce the applicable volume of cellulosic biofuel based on a projection of production for 2014. Given this reduction in the cellulosic biofuel volumes, EPA is also proposing to reduce the applicable volume of advanced biofuel using the cellulosic biofuel waiver authority in Section 211(o)(7)(D)(i). We are proposing a larger reduction in total renewable fuel volume than in the advanced biofuel volume. In effect one part of the reduction in total renewable fuel would be based on both the general waiver authority and the cellulosic biofuel waiver authority, and the remainder of the reduction in total renewable fuel would be based solely on the general waiver authority. Below we discuss the basis for each of the proposed volume reductions.

*B. Determination of Reductions in Total Renewable Fuel*

As a first step in our proposed framework for setting the applicable volumes for total renewable fuel and advanced biofuel, we would estimate the volume of ethanol that can reasonably be expected to be available and consumed and the volume of non-ethanol renewable fuel that can reasonably be expected to be available and consumed. Taken together, these two considerations provide the basis for the volume of total renewable fuel that we are proposing to require. Our objective is that the proposed requirement would reflect a realistic projected estimate of renewable fuel supply, based to the greatest extent possible on data and real world circumstances.

For ethanol, the primary issue is the use of the fuel in the transportation sector, as the purpose of the RFS program is to ensure that renewable fuels are used to replace or reduce the use of fossil fuel based transportation fuel.<sup>45</sup> For ethanol blends, there are legal constraints on the amount of ethanol that can be blended into gasoline and practical constraints on the volume of ethanol that can be consumed as transportation fuel, notwithstanding the ability to produce higher volumes. For non-ethanol renewable fuels, the primary issue is the availability of volumes of the renewable fuel, and much less so the ability to consume it in the transportation sector if it is available. For purposes of this proposal, we generally refer to the consumption concerns related to ethanol, and the availability concerns related to non-ethanol forms of renewable fuel, recognizing the primary concern that is raised for each of these types of renewable fuel.

---

<sup>45</sup> Renewable fuels in heating oil and jet fuel are also valid under the RFS program, but ethanol is not used in these contexts. See CAA section 211(o)(1)(J) (the definition of renewable fuel), and CAA section 211(o)(2)(A) (the rulemaking authority related to ensuring renewable fuels are sold or introduced into commerce).

With regard to consumption concerns related to ethanol, it is important to note that the overall pool of gasoline into which ethanol must be blended to achieve EISA's statutory volume requirements is significantly smaller now than it was projected to be prior to enactment of EISA in 2007, which established both the revised RFS program requirements and the mandated significant increases in vehicle fuel economy standards. The total demand for gasoline has been decreasing over the intervening years due to the recent GHG and CAFE standards for vehicles, fuel prices, and broader factors affecting the economy. In the summer of 2006, when the reference case for EIA's Annual Energy Outlook 2007 (AEO2007) was developed, the projected 2014 gasoline energy demand was 18.68 Quad Btu and could have absorbed 15.43 bill gal of ethanol as E10. By comparison, in the summer of 2012 when the AEO2013 reference case was developed, the projected 2014 gasoline energy demand was 15.94 Quad Btu and could absorb 13.17 bill gal ethanol as E10. The difference between these two projections thus represents about 2.3 bill gal of ethanol. That is, the gasoline pool will be able to absorb about 2.3 bill gal less ethanol as E10 in 2014 than it would have been possible to absorb if the gasoline use projection in AEO2007 had been realized. If 15.43 bill gal of ethanol were to be consumed in 2014, the gasoline energy demand projected in AEO2013 would require about 3.4 bill gal of E85 if it is assumed that intermediate blends such as E15 do not penetrate the market to any significant extent.

Table IV.B-1

## Reduced Gasoline Demand in 2014

	Motor gasoline (Quad Btu) <sup>a</sup>	E85 (Quad Btu) <sup>a</sup>	Total energy (Quad Btu) <sup>a</sup>	Equivalent E10 volume (bill gal) <sup>c</sup>
AEO2007 <sup>b</sup>	18.67	0.004	18.68	154.30
AEO2013 <sup>b</sup>	15.84	0.097	15.94	131.67
Difference				22.63

<sup>a</sup> Higher heating value

<sup>b</sup> Table 2 of EIA's Annual Energy Outlook, total delivered energy consumption for all sectors.

<sup>c</sup> Assumes conversion factors of 3.561 mill Btu per barrel for ethanol and 5.253 mill Btu per barrel for gasoline.

We recognize that EIA's most current projections for motor fuel use are provided in the Short-term Energy Outlook (STEO), which is updated monthly, rather than in the AEO2013 reference case that was prepared in the summer of 2012. EPA understands that the estimate of 2014 transportation fuel use that EIA is required to provide to EPA for purposes of determining the applicable percentage standards will be based on the latest available STEO forecast rather than the Annual Energy Outlook. The forecast for 2014 gasoline use in the October 2013 STEO is about 1.5 percent higher than the AEO2013 reference case projection for 2014, while the implicit level of E85 use from the combined gasoline and ethanol forecasts in STEO is less than half of the AEO2013 E85 projection for 2014.

#### 1. Estimating Ethanol Volumes that Could Reasonably Be Consumed



The total volume of ethanol that could reasonably be consumed is a function of three factors:

- The overall demand for gasoline
- The consumption of ethanol as E10, E15, and E85
- The presence of non-oxygenated gasoline (E0)

In this section, we provide our assessment of the likely distribution of ethanol in gasoline, with a particular emphasis on potential volumes of E85 that could reasonably be achievable. We discuss and request comment on the assumption that the overall pool of gasoline is comprised of E10 and E85 in 2014.

a. Projected Composition of 2014 Gasoline Supply

For the purposes of this proposed rule, we have assumed that all gasoline-powered vehicles and FFVs would use either E10 or E85. EPA has taken a series of regulatory steps to enable E15 to be sold in the U.S. In 2010 and 2011, EPA issued partial waivers to enable use of E15 in model year 2001 and newer vehicles, and in June of 2011, EPA finalized regulations to prevent misfueling of vehicles, engines, and equipment not covered by the partial waiver decisions. However, based on information currently available to the Agency, the volume of E15 being supplied in the market to date has been very limited. Therefore, to simplify the calculations and the discussion, we have assumed that the volume of E15 that is consumed in

2014 will be negligible, as there are currently very few retail stations offering E15. Any volumes of other intermediate blends, such as E30, are assumed to be sold through blender pumps into FFVs and are thus assumed to be part of the E85 volume consumed by FFVs.

We have not assumed that any gasoline would be E0 in 2014, since E10 is commonly used in nonroad engines just as it is used in cars and trucks. However, it is possible that a limited amount of E0 will be consumed if refiners are willing to provide it. If so, it would likely appear in premium gasoline, gasoline sold at marinas, or possibly unleaded motor gasoline used in light aircraft that do not require leaded aviation gasoline. There are also several states that require unblended gasoline to be provided to terminals, though the intention of these requirements is to ensure that terminals have the option to blend ethanol into that gasoline. We are not aware of any data that would provide a direct estimate of the demand for E0, and given that any ongoing demand for E0 is likely to be small, we have not included it in our calculations of the total volume of ethanol that can be consumed in 2014. Nevertheless, we request information and data that would permit us to determine the volume of E0 used in the gasoline pool and the appropriateness of incorporating some estimate of E0 into the final standards.

Aside from the volume of E85 that could reasonably be consumed in 2014, discussed in more detail in the next section, the gasoline pool would be comprised of E10. We have assumed that gasoline contains 10.0% denatured ethanol. This is consistent with survey data collected by the Alliance of Automobile Manufacturers indicating that the average ethanol content of all gasoline containing at least 5vol% ethanol is about 9.74%. This estimate is based on the use of ASTM test method D-5599, which measures only the alcohol portion of the gasoline, not any

denaturant that would have been included with the ethanol before it was blended into gasoline. Since the denaturant portion of ethanol is at least 2%, ethanol that is blended into gasoline contains less than 98% ethanol. When blended into gasoline, therefore, the E98 would result in a gasoline-ethanol blend containing no more than 9.8% pure ethanol, or 10.0% denatured ethanol. Since all RFS ethanol volumes and RINs are also calculated on a denatured ethanol basis, it is thus appropriate to assume 10.0 percent. We request comment, however, on the accuracy of this assessment, including information with regard to whether and to what extent there are real world constraints that limit the denatured ethanol content of E10 to a level lower than 10.0 percent, and if so, what the implications are with regard to the volume of ethanol that can reasonably be consumed in 2014.

For E85 volumes, we recognize that the ethanol content could range from 51% to 83% according to ASTM D-5798-13. In today's NPRM we have assumed that the ethanol content of E85 is 74% consistent with the average value used by EIA in its Annual Energy Outlook. As for E10, we are treating the ethanol content of E85 as representing denatured ethanol.

b. Assessment of E85 Consumption

For purposes of determining the total renewable fuel volume requirement for 2014, consistent with the waiver authorities we are proposing to exercise in this action, we have assessed the volume of E85 that can reasonably be supplied to and consumed in the transportation sector, based on a variety of factors that limit supplying E85 in the transportation

sector. Our assessment of the range of E85 volumes that can be reasonably consumed in 2014 considers factors such as infrastructure and consumer acceptance limitations as well as the impact that the applicable standards could have on the relative price of E85 and E10. In projecting the likely range of E85 consumption in 2014, we are not mandating that this amount of E85 be produced and consumed. The industries involved will decide what actually occurs in the marketplace. Obligated parties can take actions to facilitate the sale of E85, to the extent they can and choose to do so, or they can obtain RINs from non-ethanol sources of renewable fuel such as excess biodiesel, renewable diesel, heating oil, and biogas. We expect that the parties involved will resolve this through their business decisions. Nevertheless, we acknowledge that the renewable fuel volumes established in this rulemaking will have an impact on the volume of E85 consumed in 2014.

There are a variety of sources we have considered in developing our estimate of the volume of E85 that could reasonably be supplied in the transportation sector in 2014. To begin with, we investigated available sources of information on E85 production in 2012 and 2013. One report from EIA reported an E85 production volume of about 37 mill gal in 2012.<sup>46</sup> This volume is based on EIA survey data from forms EIA-810 (Monthly Refinery Report) and EIA-815 (Monthly Bulk Terminal and Blender Report). It likely underestimates actual E85 consumption as these surveys do not capture other sources of E85 production, such as the following:

- E85 produced using reformulated gasoline (RFG) or reformulated gasoline blendstock (RBOB) as the petroleum component of the fuel

---

<sup>46</sup> EIA, "U.S. Refinery and Blender Net Production", April 29, 2013

- E85 produced by refiners or blenders producing small quantities of E85
- E85 produced by parties such as ethanol production facilities

For the last category, we were able to estimate the potential volume of E85 produced in 2012 by ethanol facilities using data collected in the EPA-Moderated Transaction System (EMTS).

Ethanol production facilities are in general prohibited from separating RINs from the ethanol that they produce. However, if an ethanol producer blends its ethanol into gasoline to make a transportation fuel, it can separate the RINs from the ethanol used in this blending. If they do produce transportation fuel, it is very likely to be E85 rather than E10. Therefore, we assumed that all RINs separated by ethanol producers represent ethanol blended as E85. Under this assumption, we determined that ethanol production facilities separated about 22 million RINs in 2012, which would correspond to about 30 mill gal of E85. When combined with the 37 mill gal estimate from EIA for E85 produced by refineries and blenders, the total 2012 E85 production is estimated to be about 70 mill gal.

At this time, available information regarding the volume of E85 production in 2013 is limited to the first half of the year. Using the same two sources of information described above - EIA survey data for E85 production by refineries and blenders, and EMTS data to estimate E85 production at ethanol facilities - we have estimated that total E85 production for the first half of 2013 was about 36 mill gal. However, both of these data sources demonstrate a strongly increasing trend over this timeframe. If this trend continues through the end of 2013, total E85 production could reach 100 mill gal in 2013. Furthermore, if this trend continued throughout

2014, total E85 production would reach 240 mill gal in 2014.<sup>47</sup> If this trend were further augmented to account for the rate of ongoing growth in both the number of retail stations offering E85 and in the number of FFVs in the fleet that would occur over the remainder of 2013 and 2014, the projection for 2014 could be as high as 300 mill gal.<sup>48</sup> We anticipate that better and more detailed information will be available - including through this notice and comment process - by the time we promulgate the final rule. We solicit comment and information on 2013 consumption of E85 and its relevance to projecting reasonable levels of consumption in 2014.

It should be noted that historical consumption of E85 represents a small fraction of the consumption capacity of the FFVs currently in use. Even counting only those FFVs which have reasonable access to stations offering E85, their total consumption capacity is at least 1 bill gal. The low historical consumption was most likely due to a combination of factors including limited access to retail stations offering E85, the reduced range of vehicles operating on E85, and the fact that E85 has historically been more expensive than E10 on an energy-content adjusted basis. A survey conducted by the National Association of Convenience Stores found that 71% of customers indicated that price was the most important factor in determining where they buy gasoline.<sup>49</sup> We believe the volume of E85 that can and will be sold in the future is likely highly dependent on the price relationship between E10 and E85 and the availability of the fuel.

While historically E85 has been more expensive than E10 on an energy-content adjusted basis, recent data collected by EIA suggests that at least in some parts of the country this price

---

<sup>47</sup> Korotney, David, "Extrapolation of E85 production in the first half of 2013 to the remainder of 2013 and through 2014," memorandum to EPA docket EPA-HQ-OAR-2013-0479

<sup>48</sup> Based on 25% annual growth in E85 consumption as described in memo entitled, "Application of one-in-four E85 access methodology to 2014", Memorandum from David Korotney to EPA docket EPA-HQ-OAR-2013-0479.

<sup>49</sup> 2013 NACS Retail Fuels Report

relationship between E10 and E85 may be changing. In a *Today in Energy* article published on September 19, 2013, EIA presented data showing that in a collection of Midwestern states E85 retail prices were less than E10 retail prices on an energy-content adjusted basis in July 2013, the most recent month for which information was available.<sup>50</sup> This change in price relationship between E10 and E85 coincides with reported increases in sales volumes of E85 in Iowa and Minnesota, two states in which E85 sales volumes are publically available.<sup>51</sup> If the conditions that have led to this price relationship continue in the future E85 sales volumes are likely to continue to increase.

Moreover, as more gasoline stations sell E85 and more FFVs are sold in the United States the potential market for E85 will continue to increase. Through 2013 the number of stations selling E85 has been increasing at a rate of over 300 stations per year.<sup>52</sup> The size of the FFV fleet also increased by approximately 1 million vehicles in 2013.<sup>53</sup> If the recent pricing trends noted above persist and spread to other parts of the country the potential growth in E85 sales could be significant. Increasing E85 sales due to favorable pricing may also incentivize increasing growth rates in the number of stations selling E85 and the size of the FFV vehicle fleet. Such a scenario, however, is dependent on E85 being widely available at a price that is sufficiently lower than E10 to offset the lower energy content, increased refueling frequency requirements, and other factors. If the price relationship between E10 and E85 reverts to historic levels significant growth in E85 sales volumes is unlikely.

---

<sup>50</sup> "E85 motor fuel is increasingly price-competitive with gasoline in parts of the Midwest." *Today in Energy*. EIA, 19 September 2013. <<http://www.eia.gov/todayinenergy/detail.cfm?id=13031>>. Study compared daily average observed E85 and regular gasoline prices at the same stations in the states of Iowa, Illinois, Indiana, Kentucky, Michigan, Minnesota, and Ohio.

<sup>51</sup> See Table IV.B.1-2

<sup>52</sup> Memorandum from David Korotney to EPA docket EPA-HQ-OAR-2013-0479.

<sup>53</sup> EIA Annual Energy Outlook 2013, Table 40. Increase in Ethanol-Flex Fuel Cars and Light Trucks from 2013 to 2014.

The price relationship between E85 and E10 depends on many factors, but three of the most significant are the prices of corn, crude oil, and RINs.<sup>54</sup> Corn and crude oil are the primary contributors to the cost of production of the ethanol and gasoline, respectively, used in the United States. The RIN price functions as a mechanism to subsidize the price of ethanol sold as E85 until it is at or below price parity with gasoline on an energy-equivalent basis even if the relative prices of corn and oil would not otherwise support such a pricing structure. The net effect of a reduction in the price of ethanol is that the price of E85 should fall relative to the price of E10, since E85 contains more ethanol than E10. The significant rise in the price of D6 (non-advanced) RINs and the subsequent drop in the retail price of E85 relative to E10 over the course of 2013<sup>55</sup> occurred at a time when corn and thus ethanol was relatively expensive, indicating that RINs are already functioning in this manner. The recent shift in E85 prices relative to E10 and the simultaneous increase in E85 sales suggest the importance of paying careful attention to more recent data concerning E85 prices and sales volumes when projecting E85 volumes in 2014. While the more recent data is available from such a short period of time that it limits the confidence in using it to make projections for 2014, it nevertheless provides a basis for expecting that directionally, the lower the price of E85 compared to the price of E10, the greater the likelihood that FFV owners will opt to purchase E85. In addition to the volumetric energy content of E85 compared to E10, the price difference may also need to accommodate the inconvenience of a greater frequency of refuelings for a vehicle operating on E85, the potentially the greater driving distance to a station offering E85, the unfamiliarity that FFV owners may

---

<sup>54</sup>Other factors, including Federal and State taxes, subsidies and distribution costs, and relative convenience costs may also affect the price relationship. It is therefore very difficult to accurately predict fuel prices.

<sup>55</sup> "E85 motor fuel is increasingly price-competitive with gasoline in parts of the Midwest." *Today in Energy*. EIA, 19 September 2013. <<http://www.eia.gov/todayinenergy/detail.cfm?id=13031>>. E85 prices have fallen steadily since the beginning of 2013 relative to E10 prices.



have with E85 or their own vehicle's capabilities, and differences in the mix of vehicle types among FFVs compared to conventional (not flex fuel) vehicles. These factors may also vary from region to region across the U.S. based on state and local policies, making it challenging to develop correlations representing the nation as a whole. While we currently have insufficient data to allow us to correlate sales volumes of E85 with its price relative to gasoline on an energy basis for the nation as a whole, information from Minnesota indicates a moderately strong correlation between E85/E10 price differential and E85 sales volumes. To further aid our projections for the final rule, we request comment on the manner and extent to which RIN prices are affecting gasoline and E85 prices for the nation as a whole, and any associated changes in E85 consumption.

EPA is not in a position to estimate E85 consumption based on data or modeling involving the price relationship between E10 and E85. Therefore, in addition to information on E85 consumption in 2012 and 2013 discussed above, we have considered other sources in developing our estimate of the volume of E85 that could reasonably be consumed. The following discussion presents the various sources and approaches used to inform our estimate.

To begin with, we considered that even without further reductions in the price of E85 relative to the price of E10, higher E85 consumption in 2014 could reasonably be expected compared to 2012 and 2013 based on business-as-usual growth in the number of FFVs in-use and the number of retail stations offering E85. The combined effect of these two factors could

raise the total E85 consumption volume from our 2013 estimate of about 100 mill gal to about 125 mill gal in 2014 if the purchasing behavior of individual FFV owners remains constant.<sup>56</sup>

In the March 2010 RFS final rule we presented a means for estimating the E85 consumption capacity of FFVs based on historical market practices with diesel fuel.<sup>57</sup> We defined “reasonable access” to E85 as a situation in which one out of every four service stations to which an FFV owner had access offered E85, such that an FFV owner could be considered to have a reasonable option of refueling on E85. All other FFVs would then be assumed not to have reasonable access to E85, and would therefore always refuel on gasoline (here presumed to be E10). Following this one-in-four access approach, we estimated that approximately 8.6% of FFVs would have access to E85 in 2014 based on projections of the number of retail stations likely to offer E85. Similarly, the total amount of energy<sup>58</sup> consumed by all FFVs in 2014 would be about 9% of all the energy consumed by all light-duty vehicles and trucks. If the price of E85 reflected only the energy difference between it and E10, the total volume of E85 consumed under this approach could be about 160 mill gal. If the price of E85 was lower than this level and as a result half of all FFV owners with access used E85, the total volume of E85 consumed could reach 640 mill gal. Details of these calculations can be found in a memorandum in the docket.<sup>59</sup>

We have also considered other projections of E85 usage, recognizing the varying assumptions made in developing these projections as well as the differing purposes of the

---

<sup>56</sup> This estimate is based on two years of growth in stations offering E85 and two years of growth in in-use FFVs. Growth factors are discussed further in a memo entitled, "Application of one-in-four E85 access methodology to 2014", Memorandum from David Korotney to EPA docket EPA-HQ-OAR-2013-0479.

<sup>57</sup> See discussion at 75 FR 14761, March 26, 2010

<sup>58</sup> This estimate includes energy consumed from all fuel sources, including both E10 and E85.

<sup>59</sup> "Application of one-in-four E85 access methodology to 2014," Memorandum from David Korotney to EPA docket EPA-HQ-OAR-2013-0479

projections. For example, in their comments on the NPRM for the 2013 standards, the University of Illinois included an article from the February 13, 2013 issue of *Farmdoc Daily* in which E85 consumption in 2014 was assumed to be 300 mill gal if E85 prices were sufficiently low in comparison to E10 prices, though they did not quantify the prices needed to reach this E85 consumption level.

Finally, in the context of EPA's response to requests for a waiver of the 2012 renewable fuel volume requirements due to drought, the Department of Energy provided its own analysis of the maximum volume of E85 that could be consumed based on a technical analysis of retail station throughput.<sup>60</sup> Based on assumptions about E85 tank sizes at retail stations and the associated refill frequencies, DOE estimated that the maximum sales of E85 would be 600 mill gal.<sup>61</sup> This DOE analysis focused on the potential throughput at E85 stations given certain underground tank refueling frequencies, and did not consider such things as vehicle refueling frequencies. DOE's analysis also noted that to achieve its potential, E85 may need to be priced at a greater discount than it would be based on the energy content differential between E85 and gasoline alone to account for the more frequent refueling that E85 requires. We request comment on how DOE's analysis could be refined to better estimate potential E85 consumption.

c. Proposed Projection of E85 Consumption in 2014

---

<sup>60</sup> "Department of Energy Analyses in Support of the EPA Evaluation of Waivers of the Renewable Fuel Standard", November 2012, EPA-HQ-OAR-2012-0632-2544.

<sup>61</sup> In generating this estimate, DOE assumed that the number of retail stations offering E85 would be about 2,300. We estimate that the number of stations offering E85 will be closer to 3,300 in 2014, which would correspond to a maximum E85 throughput of about 860 mill gal.

Our goal for this proposal is to generate a realistic estimate of the amount of E85 that could reasonably be supplied to and consumed in the transportation sector in 2014 in light of the various circumstances involved with distribution and sale of E85. As with other volumes of renewable fuel, we believe that it is most appropriate to project a range of E85 volumes that reflects the volume that could reasonably be consumed in 2014. This projected range for E85 is used to determine a range for the total volume of ethanol that can be consumed, which is further combined with projected ranges for non-ethanol renewable fuels to determine a range for the total renewable fuel standard. For the final rule, we will determine a single value within the projected range that is our best estimate of a realistic projection of total renewable fuel in 2014 for purposes of exercising the waiver authority. Once the applicable volume requirements are set, the parties in the market will determine whether our estimated volume of E85 is in fact consumed, or whether other renewable fuels are consumed instead of the volume of ethanol that we estimate could be consumed as E85.

Based on our analysis of the available information described above, we are estimating a range of 100 - 300 mill gal of E85 consumption for 2014. We believe that this estimated range of E85 encompasses the most likely possibilities. Volumes below 100 mill gal are possible, but we believe that they are unlikely given that we expect such volumes to be reached in 2013 and the market conditions that resulted in these values to continue. Likewise volumes above 300 mill gal are possible, but we believe that they are unlikely. As described above, we believe that 300 mill gal of E85 could be consumed in 2014 if the monthly trends from the first half of 2013 continue unabated through both 2013 and 2014, and further increase due to growth in both retail stations offering E85 and FFVs in the fleet. E85 consumption above 300 mill gal in 2014 would

require that these trends increase even further, and in a sustained fashion, through the end of 2014. Therefore 300 mill gal is the highest value we would consider at this time as an upper end of the range of possible volumes of E85 for 2014. However, we acknowledge that the volume of E85 sold into the market is likely also a function of the standard for total renewable fuel that we set. We request comment and data from the public that would help estimate the impact of lowering the volumetric requirements on the incentive to sell ethanol blends higher than E10.

In light of current uncertainties and the limited information available at this time, we are proposing that the specific volume of E85 that we would use in determining total ethanol consumption for 2014 would be based on the mean value from the Monte Carlo analysis within the range of potential E85 volumes. As explained in Section IV.B.4 below, the Monte Carlo analysis for E85 is based on a half-normal distribution, consistent with our view that a reasonable level of E85 consumption is more likely to be towards the lower end of the proposed range. Based on this analysis, the mean value for E85 consumption would be about 180 mill gal. The mean provides a balance between the projected higher and lower volumes of E85 that could be reasonably achievable. While we believe that volumes of E85 at the high end of our proposed range are achievable and well within the capabilities of the existing vehicle and refueling infrastructure, basing the total renewable fuel volume on E85 volumes at the high end of what is achievable could present an increased risk of non-compliance for obligated parties if more E85 is called for than was projected in setting the percentage standards. This could occur, for example, if uncertainties in projected gasoline and diesel consumption for 2014 led to a requirement for more than 300 mill gal E85. By using the mean, we would reduce the likelihood of potential outcomes such as this.

The proposed mean volume of 180 mill gal for E85 is consistent with the recent upward trend in E85 production described above, where E85 is estimated to have been about 70 mill gal in 2012 and could reach and potentially exceed 100 mill gal in 2013. With regard to 2013, the increase is also consistent with available state-specific data on E85 production increases in the first two quarters.

Table IV.B.1.c-2

E85 Production in 2013 (mill gal)

	First quarter	Second quarter	% change
Minnesota	1.9	3.0	+58%
Iowa	1.8	2.6	+44%

We request comment more generally on the range of E85 consumption that could reasonably be achieved under appropriate conditions in 2014, including the methodologies and approaches that would provide a projection of E85 that could reasonably be consumed in light of the various factors affecting the distribution and sale of E85. We reiterate our recognition that there is a short time period in which to achieve infrastructural and market changes that would affect E85 consumption in 2014 and that the approach to estimating E85 consumption described above, consistent with best available information, is appropriate. We request comment in particular on methodologies and approaches that would be appropriate in light of these considerations.

d. Estimating Total Ethanol Consumption in 2014

To estimate the total volume of ethanol that could reasonably be consumed in 2014, we assumed that volumes of E0 and E15 would be essentially zero, that E85 consumption would be in the range of 100 - 300 mill gal and contain 74% denatured ethanol, and that all remaining gasoline would be E10 with a denatured ethanol content of 10%. We assumed that the total energy consumption for all gasoline-powered vehicles and engines would be 14.33 Quadrillion Btu<sup>62</sup>, and that this amount of total energy consumption is fixed regardless of the relative amounts of E10 and E85. Based on a denatured ethanol energy content of 77,000 Btu/gal and a gasoline (E0) energy content of 115,000 Btu/gal, we determined that an E85 consumption range of 100 - 300 mill gal would correspond to a total ethanol consumption volume of 12.95 - 13.09 bill gal. This ethanol volume would include non-advanced ethanol such as that made from corn as well as advanced biofuels such as sugarcane ethanol or other domestically-produced advanced ethanol.

2. Estimating Availability of Non-Ethanol Renewable Fuel Volumes

---

<sup>62</sup> EIA Annual Energy Outlook 2013, Table 37. Represents lower heating value. For determining the total volume of ethanol that can be consumed in 2014, AEO provides 2014 gasoline consumption projections in the required energy units. However, EIA's Short-Term Energy Outlook provides 2014 projections that are more recent, but in units of volume. EPA understands that the estimate of 2014 transportation fuel use that EIA is required to provide to EPA for purposes of determining the applicable percentage standards will be based on the latest available STEO forecast rather than the Annual Energy Outlook.

In addition to the volume of ethanol that could reasonably be consumed in 2014, the total volume of renewable fuel depends on the volume of non-ethanol renewable fuels that are projected to be available in 2014. These include both advanced and non-advanced non-ethanol renewable fuels of all types that could reasonably be supplied to meet all four standards.

a. Non-Ethanol Cellulosic Biofuel

The production of non-ethanol cellulosic biofuel in 2014 is projected to be between 0 and 9 million ethanol-equivalent gallons. This volume could be significantly greater if additional pathways for the generation of cellulosic biofuel RINs are approved and additional volumes of heating oil generate cellulosic RINs. For more details on the potential production of non-ethanol cellulosic biofuels in 2014, and the companies expected to produce these fuels, see Section II.

b. Biomass-Based Diesel

Obligated parties are required to fulfill a Renewable Volume Obligation (RVO) based on a national applicable volume for biomass-based diesel of 1.28 billion gal of biodiesel (1.92 billion ethanol-equivalent gallons) in 2013.<sup>63</sup> As described in Section III, in today's NPRM we are proposing that the national applicable volume for biomass-based diesel remain the same for 2014. However, this proposed requirement is not based exclusively on projected availability and

---

<sup>63</sup> 77 FR 59458, September 27, 2012 (establishing the national applicable volume for BBD)

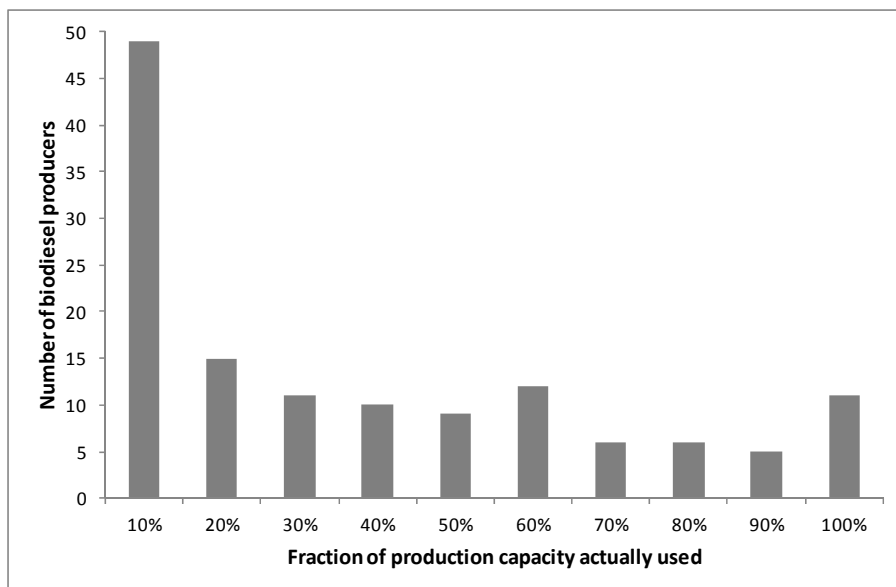


we recognize that greater volumes could be available for purposes of satisfying the advanced biofuel and total renewable fuel volume requirements.

There is a large amount of excess production capacity for biomass-based diesel, including at facilities that were in operation in 2012. While the total production capacity for all registered and unregistered biodiesel facilities is about 3.6 bill gal, the production capacity for only those facilities that produced some volume in 2012 is 2.4 bill gal, and the production capacity for facilities that utilized at least 20% of their individual production capacities in 2012 was about 1.6 bill gal.<sup>64</sup>

Figure IV.B.2.b-1

Distribution of Capacity Utilization for Registered Parties that  
Produced Some Biodiesel in 2012



<sup>64</sup> "Biodiesel plant list 2-6-13" in docket EPA-HQ-OAR-2013-0479

While there is a large amount of excess production capacity, the degree to which it will be used to produce biodiesel in excess of 1.28 bill gal depends on a variety of factors. One of those factors is the federal tax credit for biodiesel that was most recently extended through the end of 2013 under the American Taxpayer Relief Act of 2012. Under this Act, parties that produce a mixture of biodiesel and diesel fuel can claim a \$1.00-per-gallon credit against their tax liability.<sup>65</sup> This tax credit has enabled biodiesel to be more competitive with other advanced biofuels. However, as of this writing it is unclear if this tax credit will apply in 2014. Since many expect the tax credit to have a direct impact on the economic attractiveness of biodiesel, the fact that it does not yet apply in 2014 adds uncertainty to the volume of biodiesel above 1.28 bill gal that may be produced and consumed in the U.S. As discussed further in Section IV.B.4-2 below, we have assumed that the tax subsidy for biodiesel will not be extended past 2013. This is reflected in an upper end of the range for biomass-based diesel no higher than the volume that may be used in 2013, and through the use of a half-normal distribution in the context of the Monte Carlo process. We request comment on the degree to which the presence of the biodiesel tax credit in 2014 would affect our projections of the volumes that could be reasonably available in 2014. To the extent we have new information on the status of the tax credit in 2014, EPA will consider that information in the development of the final rule.

According to production data available through EMTS, the total volume of biomass-based diesel produced through August 2013 was 1,053 million gallons. Depending on how monthly production continues through the remainder of 2013, we would expect total 2013 biodiesel production to be between 1.6 and 1.8 bill gal. A projection of 1.8 bill gal results from

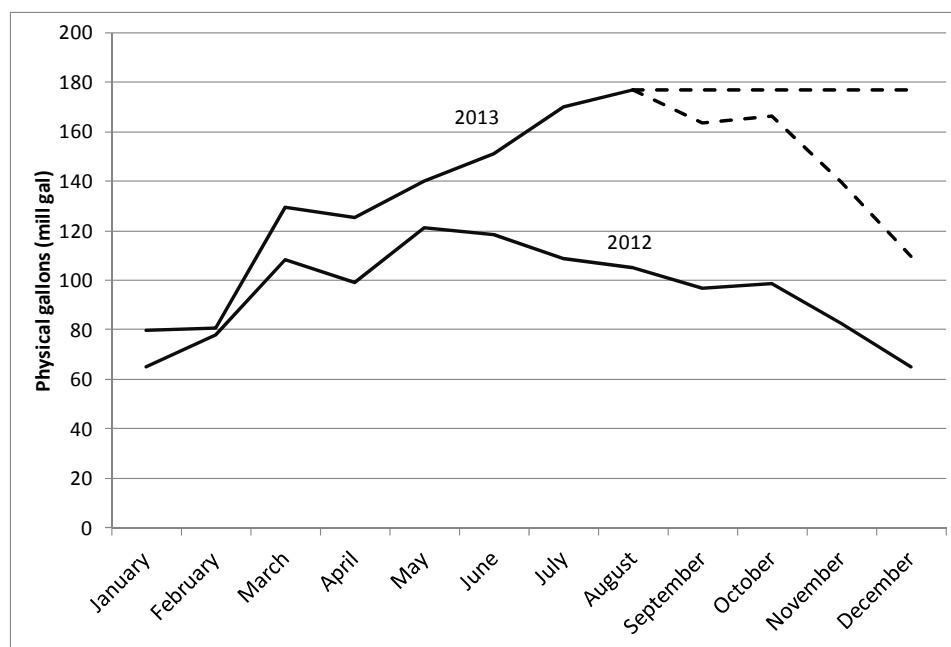
---

<sup>65</sup> See Section 405.

the assumption that the August production rate continues through the rest of 2013. If the trend in production follows the downward trend that occurred in 2012 in the September - December timeframe (representing, for example, potential seasonality of available feedstocks or demand), the total 2013 production would be 1.6 bill gal.

Figure IV.B.2.b-2

Projected Production of Biomass-Based Diesel in 2013



These 2013 biodiesel production volumes are occurring in the context of a \$1/gal tax credit.

While they provide a clear indication of the production capabilities of the industry, they do not provide an accurate indicator of the volumes that would be produced in the absence of the tax credit.

In the past some stakeholders have expressed concern that there may be limitations in biodiesel consumption that could be imposed by manufacturer warranties and cold-weather operation, and that this could impact use of biodiesel above 1.28 bill gal. However, we do not believe that this is the case for 2014. For instance, most diesel engines are warrantied by their manufacturer to B5. That is, the use of biodiesel in concentrations above 5vol% will void these warranties. While not a legal limitation on the use of biodiesel, it does present a practical limitation. Assuming a total diesel consumption volume of about 56 bill gal for 2014<sup>66</sup>, B5 for the diesel pool as a whole would correspond to a biodiesel volume of 2.8 bill gal. However, some diesel truck engines have been warrantied by their manufacturers to consume B20, starting in 2011.<sup>67</sup> This could potentially raise the limit on biodiesel consumption even higher, assuming retailers would dedicate a pump exclusively to B20 for this pool of diesel fuel consumers. Since 2.8 bill gal is significantly higher than the range of biodiesel volumes we are considering in this proposal, manufacturer warranties do not represent a limitation on biodiesel use in 2014.

Production of biodiesel in 2014 is likely to be impacted significantly by feedstock prices. Since their peak in August and September of 2012 during the height of uncertainty about the effects of the 2012 drought, prices of soybeans and soybean products have been trending downward. The USDA World Agricultural Supply and Demand Estimates (WASDE) Report's estimate<sup>68</sup> of soybean prices for the 2012/2013 marketing year have declined from an August

---

<sup>66</sup> EIA Annual Energy Outlook 2013, Table 11.

<sup>67</sup> Very few engine models are warrantied by manufacturers to consume B20 have been sold in the U.S. As such, this volume of biodiesel was assumed to be negligible for purposes of this estimate.

<sup>68</sup> See <http://www.usda.gov/oce/commodity/wasde/index.htm> (last accessed June 7, 2013); The WASDE report is a monthly report published by the U.S. Department of Agriculture (USDA) providing comprehensive forecast of supply and demand for major crops both for the US and globally. Throughout the growing season and afterwards, estimates are compared with new information on production and utilization, and historical revisions are made as necessary. It is widely considered to be the benchmark to which all other private and public agricultural forecasts are compared.

2012 range of \$15-17 per bushel to a June 2013 estimate of \$14.35 per bushel for the 2012/2013 marketing year. WASDE's June Outlook Report estimates that for the 2013/2014 marketing year (which includes the months of October through December 2013) soybean prices will range from \$9.75 – \$11.75 per bushel which is in line with the projections used by EPA in the 2013 biomass-based diesel volume final rule.<sup>69</sup>

At the same time, even biodiesel blends as low as B5 cannot be utilized year-round due to cold weather constraints. The cloud point for B5 soy methyl ester (SME) blended with No. 2 diesel is estimated to be approximately 5 °F. Thus, the use of B5 is highly unlikely in any region where temperatures regularly drop below 5 °F. Assuming that biodiesel cannot be blended in such regions during any month where the 10% percentile temperature falls below 5 °F would result in a reduction of the 2014 biomass-based diesel volume by only about 3%. This would still permit more than 2 bill gal of biodiesel to be consumed in 2014. Thus, it appears that for 2014, the ability to consume biodiesel in the vehicle fleet is not constrained by cold weather.

There are a variety of other sources that provide benchmarks for what volumes of biodiesel could be reasonably available in 2014 in excess of 1.28 bill gal. For instance, in the 2013 standards final rule<sup>70</sup>, we assessed potential feedstocks for biodiesel production, concluding that excess soy oil and corn-oil could be used to produce an additional 200 mill gal of biodiesel in 2013 above the 1.28 bill gal requirement. For 2014 the additional biodiesel from these sources could be higher. According to USDA, domestic soybean production is expected to increase by 13% in the 2013 soybean marketing year which extends through September 2014, in comparison

---

<sup>69</sup> Compare *Cf* 77 FR 59458 at 59465 with the May 10, 2013 WASDE Report released on May 10, 2013, Table 518-15. See <http://www.usda.gov/oce/commodity/wasde/index.htm> (last accessed June 7, 2013).

<sup>70</sup> 78 FR 49794, August 15, 2013.

to the 2012 marketing year.<sup>71</sup> If this occurs, then domestic production of soy oil could increase by about 240 mill gal. Regarding corn-oil, more than one third of the 320 mill gal total production was exported in 2012. These exports could be diverted to biodiesel production depending on relative prices and other factors. Taken together, the use of both additional soy oil production and the diversion of corn oil exported could bring the total biodiesel production volume to about 1.62 bill gal.

We continue to receive requests for approval of additional RIN-generating pathways for new feedstocks to expand the availability of feedstock types and for new production processes to produce biodiesel.<sup>72</sup> While the degree to which these new processes and feedstocks may be viable for the 2014 production year is uncertain, given their directional impacts on lowering cost and improving feedstock availability, we would expect that approval of such new pathways would add biodiesel production volume in 2014. For example, since the adoption of the final rule in March 2010, we have added canola and camelina oil as valid biodiesel feedstocks and analyzed the potential to produce up to 600 million gallons of biodiesel from these new feedstocks by 2022 through expanded crop production.<sup>73</sup> These feedstocks were added in response to industry requests based on their intention to expand production of these feedstocks to support biodiesel production. Since canola and camelina are established crops that can be grown for biodiesel use today, some portion of these maximum volumes could be produced in 2014, adding to the volume of feedstock otherwise available for biodiesel production.

---

<sup>71</sup> Pete Riley, "Grains and Oilseeds Outlook; 2013 Agricultural Outlook Forum," USDA/Farm Service Agency, February 22, 2013. 13% is assumed to apply only during the first 9 months of 2014.

<sup>72</sup> For example, as of June 2013, EPA had 5 petitions for new biodiesel pathways under review and had approved 3 additional petitions for new biodiesel pathways.

<sup>73</sup> See for example the final rules adding giant reed and napier grass feedstocks (74 FR 41703) and final rule adding camelina and energy cane as feedstocks and renewable gasoline and renewable gasoline pathways (74 FR 14190)

We are aware of three other sources that provide potential benchmarks for biodiesel production volume in 2014. In 2011, IHS Global Insight estimated the potential for biodiesel production over the following decade.<sup>74</sup> Under specified assumptions for crude oil price, crop yields, technology, and tax policies, this report concluded that it would be economically feasible to produce 1.54 bill gal biodiesel in the U.S. in calendar year 2014. This estimate assumed that the biodiesel tax credit would be extended beyond 2013, and did not examine a case in which the tax credit is not extended.

In their comments on the NPRM for the 2013 standards, the University of Illinois provided the results of an analysis of both production and consumption limitations for ethanol and biodiesel. They concluded that 1.7 bill gal of biodiesel could be available without overwhelming feedstock supplies, but provided little detail on the limits of feedstock supply. It also assumed the extension of the biodiesel tax credit. Darling International, Inc. also evaluated available feedstocks and concluded that 1.9 bill gal of biodiesel could be produced without diverting feedstocks from domestic food requirements. Their analysis, however, was silent with respect to whether it assumed the extension of the tax credit.

Finally, we note that there are also international sources of biodiesel that could be imported into the U.S. and which could be eligible to generate either D4 (biomass-based diesel) or D6 (renewable fuel) RINs in 2014. While there is a significant volume of biodiesel that is produced around the globe, it is unclear how much could potentially be imported into the U.S. in 2014 and accordingly we have not included these sources in our analysis of available supply.

---

<sup>74</sup> John R. Kruse, "Biodiesel Production Prospects for the Next Decade", March 11, 2011.

Based on the discussion above, we have good reason to believe that the volume of biodiesel that can be produced in 2014 will be higher than the applicable volume requirement of 1.28 bill gal. A summary of all of the sources we have considered is provided below.

Table IV.B.2.b-1

Projections of 2014 Biomass-Based Diesel Ordered from Lowest to Highest (million gallons)

Biomass-based diesel volume requirement	1,280
IHS Global Insight report	1,540
Extrapolated 2013 production	1,570
All registered biodiesel facilities that operated at least 20% of capacity in 2012	1,600
Additional soy oil production and diversion of exported corn oil to biodiesel production	1,620
University of Illinois estimate in their comments	1,700
Darling International, Inc. estimate in their comments	1,900
Production capacity of all registered biodiesel facilities that produced some biodiesel in 2012	2,400

As with E85, we believe that it would be most appropriate to project a range of possible biodiesel production volumes for 2014, using the values in Table IV.B.2.b-1 as a guide. As explained above, the volumes in the table above represent potential technical availability. We



recognize that multiple factors would ultimately influence actual production volumes. For the purposes of this NPRM, we are estimating a range of 1.28 - 1.6 bill gal of biodiesel production for 2014. While it would not be below 1.28 bill gal, as that is the required volume, it could be above the high end of 1.6 bill gal. However we estimate that it would be unlikely to be above this value, especially if the federal tax credit is not extended beyond 2013. For instance, the 1.9 bill gal estimate from Darling international, Inc. was based on extrapolating the historically high production rate from December 2011 into the future. The circumstances in December 2011 were unique: the tax credit for biodiesel was to expire at the end of that month, prompting a jump in production. Thus while it is possible that the production rate from December 2011 might be sustained in the future, we believe it is unlikely if the biodiesel tax credit is not extended past 2013. Likewise the analysis provided by the University of Illinois which projected 1.7 bill gal biodiesel in 2014 assumed that the tax credit would be extended beyond 2013. A 2011 report prepared on behalf of the National Biodiesel Board indicated that the expiration of the tax credit at the end of 2010 caused a substantial reduction in biodiesel production in 2011 compared to 2010.<sup>75</sup>

For the purposes of this NPRM, we have assumed that the biodiesel tax credit will not be extended beyond 2013. As a result, we believe that biodiesel production volumes in 2014 are more likely to be towards the lower end of our proposed range of 1.28 - 1.6 bill gal. To reflect this assumption, we have used a half-normal distribution to represent biomass-based diesel in the context of the Monte Carlo process described in Section IV.B.4 below. This distribution has a mean value of 1,405 mill gal for biodiesel.

---

<sup>75</sup> Urbanchuk, John, "Economic Impact of Removing the Biodiesel Tax Credit for 2010 and Implementation of RFS2 Targets Through 2015," Prepared by Cardno Entrix for the National Biodiesel Board, June 8, 2011 (revised).

c. Non-Ethanol Advanced Biofuel

Non-ethanol advanced biofuel other than cellulosic biofuel and biomass-based diesel has a D code of 5, and could include biodiesel and renewable diesel that is co-processed with petroleum<sup>76</sup>, heating oil, biogas, jet fuel, naphtha, and LPG. In 2012, RINs were generated for only three of these fuel types, as summarized in the following table.

Table IV.B.2.c-1

Other Non-Ethanol Advanced Biofuel Produced in 2012

(million ethanol-equivalent gallons)

Heating oil	0.2
Biogas	2.9
Renewable diesel	20.5
Total	23.6

These volumes were produced domestically and there were no volumes of non-ethanol advanced biofuel imported into the U.S. in 2012.

---

<sup>76</sup> Biodiesel and renewable diesel that is co-processed with petroleum does not meet the requirements for biomass based diesel (D4 RIN), however it may qualify as an advanced biofuel (D5 RIN)

In order to estimate a range of possible volumes of other non-ethanol advanced biofuel for 2014, we examined the Production Outlook Reports that are required to be submitted by all registered renewable fuel producers under §80.1449.

Table IV.B.2.c-2

Projections from Production Outlook Reports for Other Non-Ethanol Advanced Biofuel

Production in 2014 (million ethanol-equivalent gallons)

Biodiesel	0.2
Biogas	45.8
Naphtha	6.6
Renewable diesel	79.1
Total	131.7

Because biogas cannot be used in conventional gasoline or diesel vehicles, we investigated more closely whether the 45.8 mill gal shown in the above table was realistic for 2014. According to EPA's Landfill Methane Outreach Program, about 360 mill ethanol-equivalent gallons of biogas is currently being purified and injected into existing natural gas pipelines.<sup>77</sup> Under §80.1426 this biogas can generate advanced biofuel RINs if it is demonstrated to have been used to fuel CNG vehicles and meets all other regulatory requirements. However, this amount of biogas is on the same order of magnitude as the total volume of CNG used in all CNG vehicles each year, which

---

<sup>77</sup> Based on list of operational landfill gas (LFG) energy projects provided at <http://www.epa.gov/lmop/projects-candidates/operational.html>.

is about 420 mill ethanol-equivalent gallons<sup>78</sup>. While establishing contracts to ensure that all CNG vehicles are fueled with landfill biogas rather than fossil-based natural gas is highly unlikely to occur in the short term given the rapid expansion underway of CNG vehicles in the marketplace, we believe it is reasonable that some smaller portion of all CNG vehicles could be fueled with landfill biogas in 2014. Since the 45.8 mill ethanol-equivalent gallons of biogas from the Production Outlook Reports, shown in Table IV.B.2.c-2, represents about 11% of the annual CNG vehicle consumption, it is reasonable to expect that this volume could be used in 2014 to fuel CNG vehicles and thus generate advanced biofuel RINs. We request comment, however, on whether this level of consumption can reasonably be achieved within the relevant time frame.

Therefore, based on the actual production in 2012 and the projected production for 2014, for this NPRM we have used a range of 24 - 132 mill gal to represent non-ethanol advanced biofuel with a D code of 5. While the actual volume could be above 132 mill gal, we believe this is unlikely as this volume is based on the projections made by the producers themselves in light of their assessment of their own capabilities and plans. Likewise, while the actual volume could be below 24 mill gal, we believe this is unlikely since the industry has demonstrated that it can produce at this level. For the final rule we will update this range based on more recent data on actual production in 2013 and more recent versions of the Production Outlook Reports.

---

<sup>78</sup> EIA's Short-Term Energy Outlook, Table 5a, released in September 2013. Projection of 0.093 bill cubic feet per day for 2014. Conversion factor is 0.96 thousand Btu per cubic foot.

d. Non-Ethanol Non-Advanced Renewable Fuel

To determine a range for the non-ethanol non-advanced renewable fuel volume, we used the same approach as for the non-ethanol advanced biofuel volume. That is, we used actual 2012 production to represent the low end of the range and 2014 projections from Production Outlook Reports to represent the high end of the range. This approach resulted in a range of 1 - 25 mill gal, mostly representing production of biodiesel at facilities that have been grandfathered under §80.1403 and which may use feedstocks for which there is currently no valid RIN-generating pathway, such as sunflower or cottonseed oil. For the final rule we will update this range based on more recent data on actual production in 2013 and more recent versions of the Production Outlook Reports.

3. Treatment of Carryover RINs in 2014

In the final rule establishing the applicable standards for 2013, we estimated the volume of ethanol that would need to be consumed to meet the statutory volume requirements prior to consideration of RINs carried over from 2012 in 2013.<sup>79</sup> The total estimated volume of ethanol was 14.5 bill gal. If no ethanol blends higher than E10 were consumed in 2013, the total volume of E10 would be 131.1 bill gal (ignoring small amounts of E0) and the maximum volume of ethanol that could be consumed would thus be 13.1 bill gal. On the basis of these estimates, the volume of ethanol that is estimated to exceed the amount that could be consumed as E10 in 2013 was 1.4 bill gal.

---

<sup>79</sup> 78 FR 49794, August 15, 2013.

In addition to the option of using E85 and/or more non-ethanol renewable fuels, the 2013 standards final rule also pointed to the substantial number of RINs carried over from 2012 into 2013 that could be used in lieu of physical volumes. We determined that there would be about 2.6 billion such carryover RINs available in 2013. If the 1.4 bill gal of ethanol that is in excess of that which can be consumed as E10 in 2013 is covered entirely by carryover RINs, then there would still be at least 1.2 billion RINs that could be carried over from 2013 and available for use in 2014.

As described in the 2007 rulemaking establishing the RFS program<sup>80</sup>, carryover RINs are intended to provide flexibility in the face of a variety of circumstances that could limit the availability of RINs. More specifically, carryover RINs provide a mechanism for offsetting the negative effects of fluctuations in either supply of or demand for renewable fuels. The flexibility afforded by these carryover RINs was evidenced in the recent response of the market to the drought in 2012. The flexibility of these carryover RINs is also what we highlighted in the 2013 standards final rulemaking as providing the opportunity for compliance despite potential constraints on physical ethanol consumption.

In the context of determining the appropriate volume requirements for 2014, as for 2013 it would be appropriate to consider carryover RINs that may be available. However, we believe it is also important to the viability of the market that some reasonable amount of carryover RINs continue to be available. Carryover RINs act as a buffer, and allow the regulated parties to address unforeseen circumstances that could limit the availability of RINs, and to address

---

<sup>80</sup> 72 FR 23900, May 1, 2007.

renewable fuel supply circumstances that differ from those assumed in the process of generating the projected volume ranges discussed above. The provision for carryover RINs recognizes that Congress structured the RFS program to provide a degree of flexibility for the obligated parties. In 2013 preserving such a buffer was not a concern, since even if the 1.4 bill gal of ethanol that is estimated to be in excess of that which can be consumed as E10 in 2013 is covered entirely by carryover RINs, there would remain at least 1.2 billion additional, unused carryover RINs. For 2014, however, if we accounted for all 1.2 billion carryover RINs in setting the applicable standards, obligated parties would be left with no flexibility for addressing other unforeseen circumstances. We believe that a standard-setting process that included an assumption that the carryover RIN balance would be reduced to zero would be contrary to the original intention of the provision for providing a degree of flexibility through carryover RINs. For this reason, we have not accounted for carryover RINs in our assessment of the reductions in the statutory volume requirements that would be appropriate in setting the RFS standards for 2014. For years after 2014, if circumstances differ substantially from those described here, we may again consider the existence of carryover RINs in the standard-setting process depending on the number of carryover RINs expected to be available and projections of supply and consumption of renewable fuels. We request comment on whether and how to account for carryover RINs in setting the standards.

#### 4. Proposed Range for the Volume Requirement for Total Renewable Fuel

As discussed in the preceding sections, we have estimated volume ranges for five different categories of renewable fuel as a step towards estimating the volume requirement for total renewable fuel for 2014. These ranges are summarized below.

Table IV.B.4-1

Volume Ranges for Estimating Total Renewable Fuel Volume for 2014

(million ethanol-equivalent gallons)

Ethanol that can be consumed	12,954 - 13,087
Available volumes of non-ethanol cellulosic biofuel	0 - 9
Available volumes of biomass-based diesel	1,920 - 2,400 <sup>a</sup>
Available volumes of non-ethanol advanced biofuel	24 - 132
Available volumes of non-ethanol non-advanced renewable fuel	1 - 25

<sup>a</sup> Represents a physical volume range of 1.28 - 1.6 bill gal

By aggregating these five categories, we can estimate the total volume of renewable fuel that represents both the volume of ethanol that could reasonably be consumed as E10 and higher ethanol blends, and the volume of all non-ethanol renewable fuels that could reasonably be available to meet the four applicable standards. We note that in practice these five categories are not independent from one another, since different types of renewable fuel will differ in terms of their cost and higher volumes of one type of renewable fuel will reduce the need for volumes from another category in the context of meeting the applicable volume requirements. However, since the ranges shown above are intended to encompass reasonably achievable volumes for each



type of renewable fuel, we believe that they can be treated as independent for the purposes of the aggregation described below.

In order to aggregate the ranges in Table IV.B.4-1 into a single range for total renewable fuel, we used a Monte Carlo analysis to account for the need to aggregate multiple ranges, each having different likely distributions of likelihood across their range. As discussed in the preceding sections, the high and the low end of each range represents values such that it is possible but unlikely that volumes would be outside of those ranges. We have therefore treated these individual ranges as representing the 90% confidence interval of a distribution of possible volumes. In other words, the low end of the range would represent the 5th percentile and the high end of the range would represent the 95th percentile. This approach is consistent with our judgment that, while the ranges shown in Table IV.B.4-1 are intended to encompass the vast majority of possible volumes, there remains a small possibility that volumes outside of those ranges are possible. We believe it is reasonable to treat these ranges as representing 90% confidence intervals for purposes of the Monte Carlo analysis, though we request comment on treating them as a different confidence interval such as 80% or 95%.

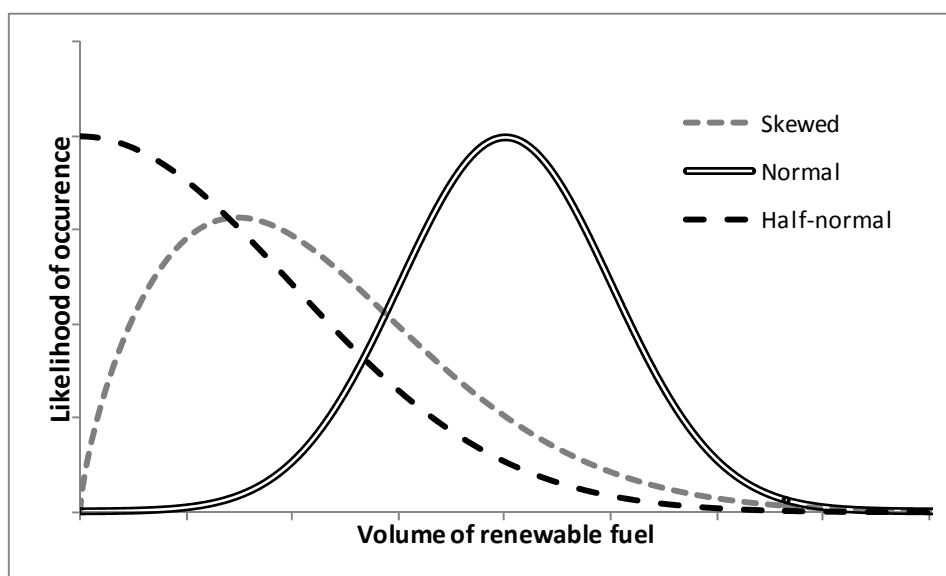
As an alternative to a Monte Carlo process for aggregating the volumes in Table IV.B.4-1, we could use a simple summation of the ranges (i.e. basing the low end of the range of total renewable fuel on the sum of the low ends of the ranges for each of the five different categories, and likewise for the high end of the range). However, we do not believe that such an approach would be appropriate. Doing so would tend to exaggerate the width of the range for the required volume of total renewable fuel as it is highly unlikely that 2014 volumes for each of these

categories will simultaneously be at the extreme low or high end of the proposed ranges, and would also mischaracterize biofuel categories wherein one end of the range is expected to be more likely than the other. Nevertheless, we request comment on this or alternative methods to the Monte Carlo approach for aggregating the volumes shown in Table IV.B.4-1.

For the purposes of the Monte Carlo analysis, we are also proposing an appropriate shape to represent the applicable distribution of volumes within each range. The shape of the distribution of volumes is based on factors unique to each source of renewable fuel. We identified three standardized distributions that we can use to reasonably represent uncertainty in the distribution of volumes for each of the sources of renewable fuel under consideration.

Figure IV.B.4-1

Standardized Distributions Used to Aggregate Ranges<sup>a</sup>



<sup>a</sup> The skewed distribution is based on a Weibull distribution with a shape parameter of 0.5 and a scale parameter of 1.7.

These three standardized distributions provide a mechanism for representing the regions within each projected volume range where the greatest likelihood of reasonably achievable volumes may lie, based on considerations of the various sources of uncertainty unique to each source of renewable fuel. We recognize that the half-normal distribution would by definition include a mode of zero, and that this would imply that the greatest likelihood of occurrence is at the low end of the range. For sources of renewable fuel wherein the low end of the range is estimated to be zero, for instance for some cellulosic biofuel facilities as discussed in Section II.C, the use of the half-normal would appear to suggest that zero is the most likely result. However, in the context of the Monte Carlo process for combining volume ranges from different sources, we are proposing to use the mean rather than the mode as described more fully below. Nevertheless, other distributions might be reasonable to address concerns about the mode in the half-normal distribution. For instance, a gamma distribution could be used, or a Weibull distribution with greater skewness than that shown in the figure above. We request comment on the use of these alternative distributions.

In the case of biomass-based diesel, we are proposing that the applicable volume requirement for 2014 would be 1.28 bill gal. Since this volume would be required, there is no realistic likelihood that the actual volume will be below 1.28 bill gal. While production volumes of biomass-based diesel in 2013 are expected to substantially exceed the required volume of 1.28 bill gal, this is likely driven in large part by the tax credit for biodiesel, currently scheduled to expire at the end of the year, on the price of D6 RINs which have increased since the beginning of 2013, and potentially other factors as well. Without the tax credit in place, demand for biodiesel substantially beyond the required volume is uncertain. Under the assumption that the

biodiesel tax credit will not be extended beyond 2013, we believe that any additional incremental volumes above 1.28 bill gal would be progressively less likely than the required volume. This suggests that a half-normal distribution would be the most appropriate way to represent volumes of biomass-based diesel. With regard to non-ethanol cellulosic biofuel, we developed a distribution that was based on an aggregation of projected volume ranges for each cellulosic biofuel facility. See Section II.C for more discussion. For the total volume of ethanol that could reasonably be consumed, we chose a half-normal distribution representing ethanol in E10 and E85 because there is little historical information on how market prices for E85 might respond to higher RIN prices, nor on how FFV owners might respond to changes in the relative price of E85 and E10. In the future it may be more appropriate to use a skewed or normal distribution for the total volume of ethanol to reflect a growing understanding of the impact that RIN prices have on the retail price of E85 and the impact that E85 prices have on consumer choice. For volumes of non-ethanol advanced biofuel and non-ethanol non-advanced renewable fuel, we chose normal distributions because we believe there is an equal likelihood that the volumes that could be made available would be on either the low end of the respective ranges or the high end of the respective ranges. We do not believe that actual historical volumes, which form the basis for the low end of the range in both cases, should also be used as justification for using skewed distributions. The distributions that we used for each of the five categories of renewable fuel are shown below.

Table IV.B.4-2

Standard Distribution Assumptions Used in Estimating Total Renewable Fuel Volume for 2014

Ethanol that could reasonably be consumed	Half-normal
Available volumes of non-ethanol cellulosic biofuel	Combined <sup>a</sup>
Available volumes of biomass-based diesel	Half-normal
Available volumes of non-ethanol advanced biofuel	Normal
Available volumes of non-ethanol non-advanced renewable fuel	Normal

<sup>a</sup> As described in Section II.C, this distribution is a combination of the distributions for all facilities projected to produce non-ethanol cellulosic biofuel using the same Monte Carlo process.

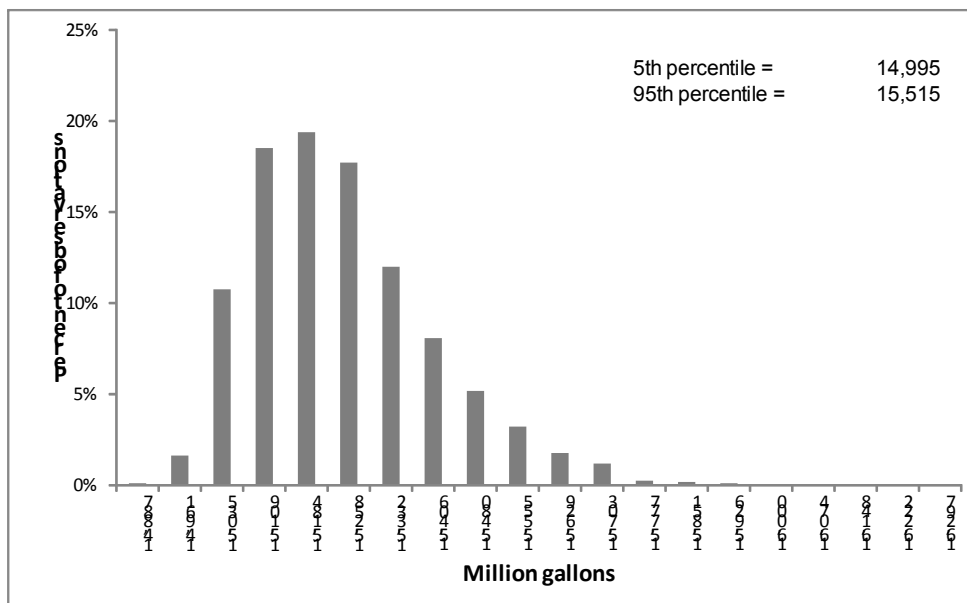
Based on the estimated ranges and distributions, we used a Monte Carlo process to aggregate the five distributions into a single distribution representing total renewable fuel. The Monte Carlo process randomly samples each of the five distributions in an iterative fashion. The results of all the iterations were then summed to produce a distribution for total renewable fuel. The figure below shows the resulting distribution after 3000 iterations. Details of the Monte Carlo process are provided in a memo to the docket.<sup>81</sup>

---

<sup>81</sup> David Korotney, "Application of Monte Carlo process to the determination of proposed volume requirements for 2014 standards NPRM," memorandum to EPA Air Docket EPA-HQ-OAR-2013-0479

Figure IV.B.4-2

Results of Monte Carlo Simulation for Total Renewable Fuel



We recognize that the Monte Carlo process is an approximation to the mathematical formula that would result if the probability density functions for each of the distributions shown in Figure IV.B.4-1 were combined mathematically using convolution. However, we believe that the additional complexity of such a process is not warranted given the uncertainty inherent in the volumes ranges and the assigned distributions. The Monte Carlo process for combining distributions provides a reasonably accurate result with a considerably simpler process.

Based on this approach to aggregating the five ranges shown in Table IV.B.4-1, the volume of total renewable fuel that we are proposing for 2014 would fall within the range of 15.00 - 15.52 bill gal.<sup>82</sup> Given that the applicable volume in the statute is 18.15 bill gal, this range represents a reduction of 2.63 - 3.15 bill gal. Within the uncertainties discussed above for each of the components, a range of 15.00 - 15.52 bill gal represents a volume of renewable fuel that reasonably accounts for both limitations in the volume of ethanol that can be supplied and consumed as well as limitations in the availability of non-ethanol renewable fuels.

The distribution generated by the Monte Carlo process also provides a basis for determining a specific value within the range. We do not believe that using either the low end or high end of the proposed range would be appropriate as the basis for the applicable standard. While we believe that the upper end of the projected range is achievable, basing the total renewable fuel volume on this higher value could present an increased risk to obligated parties if, for example, uncertainties in projected gasoline and diesel consumption for 2014 lead to a requirement for more renewable fuel than is available or can be consumed. A value between the low and high ends, in contrast, would better account for cases in which the actual values for some of the input volumes fall at the high end of their respective ranges while the actual value of other input volumes fall at the low end of their ranges. Options for a value falling between the low and high ends of the range include the mean, the mode (highest frequency value) and the median (50th percentile). It may also be reasonable to use a value representing higher or lower values in the distribution, such as the 25th or 75th percentile. The table below shows the values for each of these approaches that correspond to the distribution in Figure IV.B.4-2.

---

<sup>82</sup> The numbers are expressed as two significant digits to reflect that the applicable volumes in the statute are expressed this way.

Table IV.B.4-3

Potential Approaches to Determining the  
Total Renewable Fuel Volume Requirement  
(million ethanol-equivalent gallons)

Mean	15,207
Mode	15,059
25th percentile	15,084
50th percentile	15,183
75th percentile	15,297

In today's NPRM, we are proposing to use the mean value for the volume requirement for total renewable fuel, which represents our best estimate of the average amount of renewable fuel volumes that could reasonably be supplied. However, we request comment on whether it would be more appropriate to utilize either the mode or median (50<sup>th</sup> percentile), or some other value in the appropriate range shown in Table IV.B.4-3 that best reflects renewable fuel volumes that could reasonably be supplied under this program.

As discussed throughout this section, there is considerable uncertainty in the estimates of some of the various components from which the required volume for total renewable fuel has been derived. There are many factors affecting supply, and they could lead to greater or lesser supply of renewable fuels than projected, such as higher or lower volumes of non-ethanol renewable fuel or advanced biofuels, higher or lower volumes of E85, the degree to which E0 is



used, if any, and so on. Obligated parties also have significant flexibility to address compliance through a number of various approaches, such as the ability to use carryover RINs generated in 2013, or to carry a compliance deficit into 2015. Our proposed approach for dealing with this uncertainty has been to develop ranges for the various components and utilize the Monte Carlo process for aggregating the components into a single range and mean value. These estimates will be refined for the final rule based on more up-to-date information and any new information received through the public comment process. We have used this approach to develop the best available volume projections using current information.

We understand that values lower or higher than the mean also could be used. For example, some parties may believe that a value lower than the mean should be used to provide greater confidence in the adequacy of supply, and avoid the risks associated with a volume reduction that is not sufficient to address the supply problems. From the perspective of production and use of renewable biofuels, in contrast, a higher value than the mean would avoid the risks associated with a volume reduction that is more than what is necessary to address the supply problems. As noted, our current view is that the best approach for resolving this uncertainty is to neither underestimate nor overestimate the market's capacity to supply and consume renewable fuels. We request comment on our proposed approach and alternate approaches described here.

### *C. Determination of Reductions in Advanced Biofuel*

The second step in our proposed framework for setting the applicable volume standards would be to determine an appropriate reduction in advanced biofuel that accounts for the availability of advanced biofuels in light of the significant shortfall in cellulosic biofuel compared to the statutory volume, as well as the contribution of ethanol in this category to the supply concerns related to total renewable fuel. The proposed volume of advanced biofuel should also support the goals of the RFS program for continued growth in the advanced biofuel category as reflected in the increasing gap between the cellulosic biofuel and advanced biofuel volumes set by EISA.

#### 1. Available Volumes of Advanced Biofuel in 2014

Using a process similar to that for total renewable fuel in Section IV.B above, we determined the maximum volume of advanced biofuel that can reasonably be available in 2014. This volume defines the upper limit for any potential volume requirement we would set for advanced biofuels under the overall approach we are proposing. As described more fully in Section IV.A above, availability is one important factor to consider in determining the appropriate volume of advanced biofuel to require. However, as discussed in Section IV.C.2 below, for 2014 additional considerations lead us to propose to set the advanced biofuel volume requirement at a level below the total available volume.

In this section we describe the estimation of reasonable ranges for four separate categories of advanced biofuel, including:

- Cellulosic biofuel
- Biomass-based diesel
- Domestic Production of Other Advanced Biofuel
- Imported Sugarcane Ethanol

a. Cellulosic biofuel

As discussed in Section II above, the production of cellulosic biofuel in 2014 is projected to be between 8 and 30 million ethanol-equivalent gallons. This range can be separated into ethanol and non-ethanol components as shown below.

Table IV.C.1.a-1

Projected Volumes of Cellulosic Biofuel for 2014

(million ethanol-equivalent gallons)

Ethanol	5 - 25
Non-ethanol	0 - 9
Total	8 - 30

The projected volume could be significantly greater if pathways for the generation of cellulosic biofuel RINs from landfill biogas and corn kernel fiber are approved and additional volumes of

cellulosic heating oil are produced. For more details on the potential production of non-ethanol cellulosic biofuels in 2014, and the companies expected to produce these fuels, see Section II.

b. Biomass-Based Diesel

The range of biomass-based diesel that we used in estimating the availability of advanced biofuel is the same as the range that we used in determining the proposed volume of total renewable fuel. Table IV.B.2.b-1 lists the sources that we used to conclude that there could be 1.28 - 1.6 bill gal of biodiesel production in 2014.

c. Domestic Production of Other Advanced Biofuel

In Section IV.B.2.c above we used 2012 production data and Production Outlook Reports to develop a range of 24 - 132 mill gal representing non-ethanol advanced biofuel with a D code of 5. These same sources were used to develop a range of ethanol advanced biofuel with a D code of 5.

In 2012, 28 mill gal of ethanol advanced biofuel (other than cellulosic ethanol) was produced in the U.S. Based on Production Outlook Reports, we project that domestic production of such biofuel using some combination of sugarcane, grain sorghum, and separated food wastes could be as high as 142 mill gal. Based on these sources, for this NPRM we have used a range

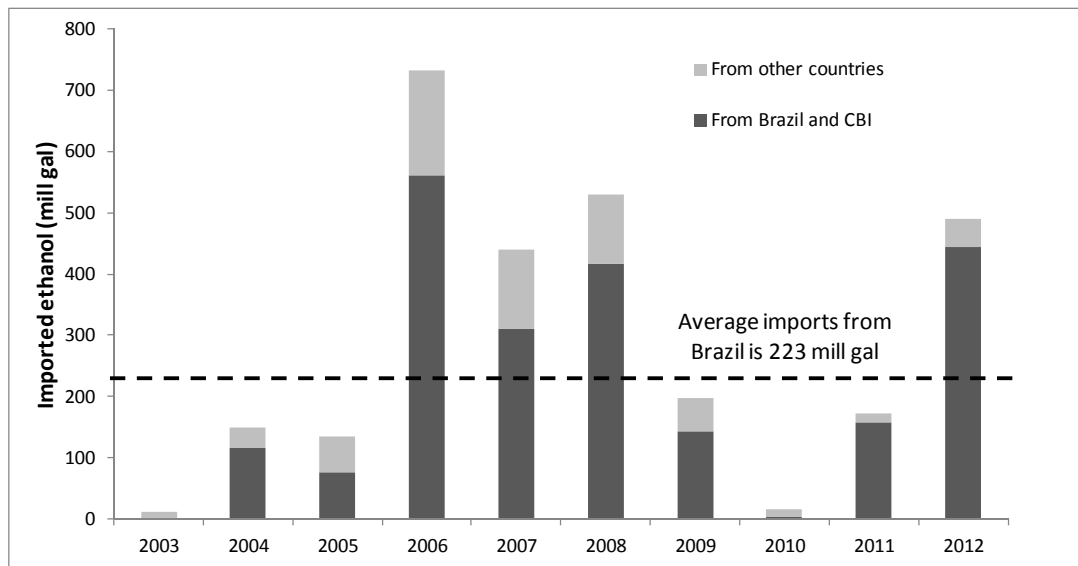
of 28 - 142 mill gal to represent domestic production of ethanol advanced biofuel with a D code of 5.

d. Imported Sugarcane Ethanol

Sugarcane ethanol qualifies as advanced biofuel, and historically the U.S. has imported substantial volumes of it. Imports from the last ten years are shown below. While ethanol imported into the US is not produced exclusively from sugarcane, it has historically been the primary feedstock for ethanol imported into the U.S. and is expected to continue to be the primary feedstock of ethanol imported into the U.S. in future years. While the generation of advanced biofuel RINs from sugarcane ethanol is not limited to ethanol imported from Brazil, historically Brazil has been the source of the majority of ethanol imported into the United States. As such, this section focuses on the availability of sugarcane ethanol imported from Brazil.

Figure IV.C.1.d-1

Historical Imports of Ethanol into the U.S.



Source: EIA, "U.S. Imports by Country of Origin."

As some stakeholders have noted before, imported volumes of ethanol have been highly variable. As a commodity traded on the world market, the market clearing price and quantity of Brazilian ethanol sold into the U.S. market fluctuates over time. Significant factors that can affect the price and quantity of ethanol imported into the U.S. include:

- Sugarcane harvest (both acres planted and yield)
- Worldwide market for sugar
- Worldwide demand for sugarcane ethanol
- Brazilian demand for ethanol, including the minimum ethanol content of gasoline as specified by the Brazilian government
- Potential for exporting corn-ethanol from the U.S. to Brazil

- Opportunities for sale of sugarcane ethanol in the U.S. which is a function of the RIN price for advanced biofuel, legal and practical constraints on the volume of ethanol that can be consumed, state Low Carbon Fuel Standards (LCFS) program demand, and the availability and price of competing advanced biofuels such as biodiesel
- Import and export tariffs

Production of sugarcane in Brazil in recent years has been lower than normally expected due to two factors. First, adverse weather conditions reduced production.<sup>83</sup> For example, adverse weather conditions are estimated to have reduced cane production by about 4% in the 2011/2012 marketing year.<sup>84</sup> Thus, a return to more typical weather conditions, such as occurred in the 2012/2013 agricultural marketing year, in the timeframe that this rulemaking considers would by itself restore approximately 4% of production. Second, the general global economic downturn in recent years made obtaining credit more difficult in the Brazilian sugar cane industry, resulting in delayed replanting of existing fields. Normally sugarcane fields are replanted every five or six years to maximize yield. However, the lack of available credit caused some growers to delay the expense of this replanting, resulting in older fields losing production.<sup>85</sup> It appears that credit conditions have eased and that more direct investment in sugar cane production and milling in Brazil is occurring.

---

<sup>83</sup> Gain Report BR110016, October 3, 2011, USDA Agricultural Service. See [http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Sugar%20Semi-annual\\_Sao%20Paulo%20ATO\\_Brazil\\_10-3-2011.pdf](http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Sugar%20Semi-annual_Sao%20Paulo%20ATO_Brazil_10-3-2011.pdf)

<sup>84</sup> The sugar marketing year in Brazil's center-south sugar-producing region, where the large majority of production occurs, runs from May through April.

<sup>85</sup> On the margin, the high sugar prices may have also encouraged some growers to divert their crop from ethanol production to sugar production. But most cane growers do not have this flexibility with sugarcane mills designed for fixed amounts of refined sugar or ethanol so high sugar prices was likely a contributing factor but not a major cause of reduced sugarcane ethanol production in Brazil.

Some parties expected a more typical trend in sugarcane ethanol production for the 2012/2013 through the 2014/2015 harvest years, with replanted fields boosting sugarcane production in existing plantations and, in response to increased worldwide demand, a growth in the acres planted with sugarcane. Increased production is supported by the Brazilian government which announced in February 2012 support for a plan to invest over \$8 billion annually to boost cane and ethanol production.<sup>86</sup> Private investment in Brazil may also be increasing. For example, Usina de Acucar Santa Terezinha, a Brazilian ethanol producer, last year announced plans to invest almost \$300 million in a new mill and sugarcane plantation.<sup>87</sup> Such information suggests that sugarcane and ethanol production in the 2013/14 and 2014/15 harvest years could be higher than production in 2011 and 2012.

Brazil's sugarcane ethanol production serves both its domestic market as well as the export market. The government of Brazil sets a minimum ethanol concentration for its gasoline. In 2011, the Brazilian government lowered this concentration to 20%, reflecting in part the decrease in domestic ethanol production. However, given the more optimistic production outlook, Brazil raised the minimum ethanol concentration to 25% effective May 1, 2013.<sup>88</sup> The 25% concentration rate is the highest allowed by law in Brazil. The ability of the Brazilian government to reset the minimum ethanol content introduces some uncertainty in projecting future Brazilian demand. However, historically, adjustments have been infrequent, relatively small in degree (a few percent), and largely influenced by the price of ethanol (high prices leading to a reduction in the minimum). Indeed, as evidenced by the reduction to a 20%

---

<sup>86</sup> See <http://www.platts.com/RSSFeedDetailedNews/RSSFeed/Oil/8987702>

<sup>87</sup> See <http://www.bloomberg.com/news/2012-03-08/santa-terezinha-invests-283-million-in-brazil-ethanol-projects.html>

<sup>88</sup> Platts, "Brazil to raise ethanol mix in gasoline to 25% from 20% May 1," <http://www.platts.com/RSSFeedDetailedNews/RSSFeed/Oil/8194390>



blending rate in 2011, the Brazilian government considers the likely supply of sugarcane ethanol to support its domestic needs in setting the minimum ethanol content of its blended fuel.

The Iowa State/CARD model projects that Brazil will produce roughly 8.7 bill gal of ethanol in 2014. Non-fuel use and Brazilian ethanol exports to countries other than the U.S. is estimated to be around 500 million gallons, which leaves roughly 8.2 bill gal for Brazilian consumption and for exports to the U.S. If the minimum blending rate for ethanol in motor vehicles in Brazil is set at 25% (the current rate), Iowa State estimates that Brazil will consume roughly 5.9 bill gal of ethanol. At a 20% minimum blend rate, ethanol demand in Brazil would be roughly 5.2 bill gal. Therefore, even with the 25% minimum blending requirement for ethanol in vehicles, Brazil should have up to 2.8 bill gal available for a wide variety of domestic uses as well as the potential to export ethanol to the U.S.<sup>89</sup> Thus, assuming that the 25% blending rate remains in effect through 2014 (including both the 2013/14 sugarcane season which ends in May 2014 and the subsequent 2014/15 sugarcane season), the analyses referenced below suggest that more than enough ethanol should be available assuming normal weather patterns to support both the Brazilian domestic demand as well as export to the U.S. in 2014.

The historical volumes of sugarcane ethanol imports into the U.S. from Brazil are indicative of Brazilian production and export capacity, and thus provide several benchmarks for the volume that could potentially be imported into the U.S. in 2014. For instance, the average import volume over the last ten years is 223 mill gal, while the maximum volume was 560 mill gal in 2006. In 2010 Brazil had its largest ethanol production volume in recent history, and in

---

<sup>89</sup> Personal Communication with Dr. Bruce Babcock, Iowa State, June 27, 2013

that same year it exported 490 mill gal to the U.S. Finally, the largest total export volume from Brazil to all other countries was 1.35 bill gal in 2008.

There are several other sources providing estimates of what import volumes of Brazilian sugarcane ethanol may be possible in 2014. In an addendum to its Annual Energy Outlook 2013, EIA included an estimate of sugarcane ethanol imports of 719 mill gal for 2014.<sup>90</sup> In their comments on the 2013 standards NPRM, the Brazilian Ministry of Mines and Energy indicated that Brazil could achieve exports of 800 mill gal to the U.S. in 2014. A recent report from Iowa State University indicated that total ethanol imports could be 310 - 820 mill gal in 2014, depending on whether the biodiesel tax credit remains in effect.<sup>91</sup>

The Food and Agricultural Policy Research Institute (FAPRI) publishes several different documents that also provide some benchmarks. The 2012 World Agricultural Outlook projected that total net exports of ethanol from Brazil could be 1,259 mill gal in 2014,<sup>92</sup> while their Biofuel Baseline projects that total ethanol imports into the U.S. could reach 496 mill gal in 2014.<sup>93</sup>

Based on the discussion above, we have compiled a list of benchmarks that we believe can be used to estimate a range of import volumes for Brazilian sugarcane ethanol.

---

<sup>90</sup> "AEO2013 - Addendum on Ethanol Trade Balance.pdf" document submitted to docket EPA-HQ-OAR-2013-0479.

<sup>91</sup> Bruce A. Babcock et al, "Biofuel Taxes, Subsidies, and Mandates: Impacts on US and Brazilian Markets," Staff Report 13-SR 108, May 22, 2013.

<sup>92</sup> FAPRI-ISU 2012 World Agricultural Outlook, "Ethanol Trade"

<sup>93</sup> FAPRI-MU Biofuel Baseline, March 2013. FAPRI-MU Report #02-13. Values for the 2013/2014 agricultural year were averaged with those from the 2014/2015 agricultural year assuming that the year begins in September and ends in August.

Table IV.C.1.d-1

Projections of 2014 Imported Sugarcane Ethanol Ordered from Lowest to Highest

(million gallons)

Average import volumes from 2003 - 2012	223
ISU Staff Report - biodiesel tax credit in place	310
Ethanol exported from Brazil to the U.S. when ethanol production was at its historical maximum (2010)	490
FAPRI Biofuel Baseline	496
Production Outlook Reports	510
Historical maximum ethanol imported into the U.S. from Brazil (2006)	560
AEO2013	719
Projection from Brazilian Ministry of Mines and Energy	800
ISU Staff Report - biodiesel tax credit not in place	820
FAPRI 2012 World Agricultural Outlook - total Brazilian exports in 2014	1,259
Historical maximum ethanol exported from Brazil (2008)	1,350

For the purposes of this NPRM, we estimate, based on a review of the benchmarks shown in the table above, that a range of 300 - 800 mill gal of Brazilian sugarcane ethanol could be available for import to the U.S. in 2014. We do not believe that it would be appropriate to use

either the highest or lowest values in the table since they are unlikely to reasonably represent the market circumstances in 2014.

While the volumes of sugarcane ethanol imported into the U.S. in 2012 were about 500 mill gal, and in 2013 could reach a similar level, we believe it is reasonable to use 300 mill gal as the low end of the range for 2014. There has been significant variability in sugarcane ethanol imports in the past, so volumes below 500 mill gal are possible depending on market factors and relevant public policies in both countries. While volumes above 800 mill gal are possible, we believe that they are unlikely given that the Brazilian agency responsible for projections of exports indicated that 800 mill gal would be achievable in 2014, and 800 mill gal would be a substantially higher import volume of Brazilian sugarcane ethanol than in any previous year.

We have used a projected range of 300 - 800 mill gal for imported sugarcane ethanol in our estimate of the total volume of advanced biofuel that could be available in 2014. However, as described in Section IV.C.2 below, we are not proposing to use only availability in the determination of the applicable volume requirement for advanced biofuel. Thus the proposed volume requirement for advanced biofuel would not require the use of 300 - 800 mill gal of sugarcane ethanol, and the actual volume of sugarcane ethanol that is imported will be highly dependent upon competition in the U.S. market with other advanced biofuels that could be available.

e. Summary

As discussed in the preceding sections, we have estimated volume ranges for six different categories of advanced biofuel as a step towards estimating the availability of advanced biofuel for 2014. We also identified which of the three standardized curves shown in Figure IV.B.4-1 would be most appropriate for each category. A discussion of the standardized distributions for cellulosic biofuel, biomass-based diesel, and domestic non-ethanol advanced biofuel are provided in Section IV.B.4 above. For volumes of ethanol advanced biofuel, we chose a normal distribution because we believe there is an equal likelihood that the volumes that could be made available would be on either the low end of the range or the high end of the range. A normal distribution for ethanol advanced biofuel is also consistent with our approach to non-ethanol advanced biofuel, as both ranges were developed from the same sources. For volumes of imported sugarcane ethanol, the most recent historical data on actual imports suggests that the middle of the range 300 - 800 mill gal is likely, and this suggests that a normal distribution is more reasonable than a skewed distribution. The advanced biofuel ranges and the assumed standardized distributions are summarized below.

Table IV.C.1.e-1

## Volume Ranges for Estimating Advanced Biofuel Availability for 2014

(million ethanol-equivalent gallons)

Available volumes of non-ethanol cellulosic biofuel	0 - 9	Skewed
Available volumes of ethanol cellulosic biofuel	5 - 25	Combination <sup>a</sup>
Available volumes of biomass-based diesel	1,920 - 2,400 <sup>b</sup>	Half-normal
Available volumes of domestic non-ethanol advanced biofuel	24 - 132	Normal
Available volumes of domestic ethanol advanced biofuel	28 - 142	Normal
Available volumes of imported sugarcane ethanol	300 - 800	Normal

<sup>a</sup> As described in Section II.C, this distribution is a combination of the distributions for all facilities projected to produce non-ethanol cellulosic biofuel.

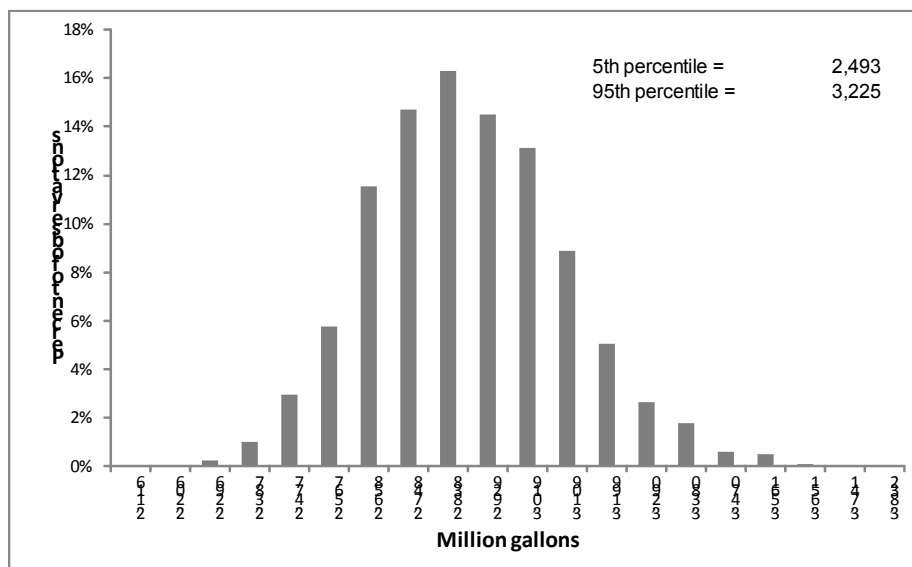
<sup>b</sup> Represents a physical volume range of 1.28 - 1.6 bill gal

As for the total renewable fuel volume, the high and the low end of each range represents values such that it is possible but unlikely that volumes would be higher or lower than this range. EPA therefore treated each individual range in Table IV.C.1.e-1 as representing the 90% confidence interval of the applicable standardized distribution. We then used a Monte Carlo process in which each of the six distributions were randomly sampled in an iterative fashion.

The results of all the iterations were then summed to produce a distribution for advanced. The figure below shows the resulting distribution after 3000 iterations.

Figure IV.C.1.e-1

#### Results of Monte Carlo Simulation for Advanced Biofuel Availability



Based on this approach to aggregating the six ranges shown in Table IV.C.1.e-1, we believe that available volumes of advanced biofuel are likely to fall within the range of 2.49 - 3.23 bill gal. Given that the volume requirement in the statute is 3.75 bill gal, this range of availability represents a reduction of 0.52 - 1.26 bill gal.

## 2. Options for Determining Appropriate Reductions in Advanced Biofuel

While projected availability defines the upper limit of the volume requirement we would set for advanced biofuel, we have also considered two other factors: the contribution of ethanol in the advanced category to the supply concerns discussed above with respect to total renewable fuel, and the RFS program's goal of growth in the advanced biofuel category. Below we discuss three approaches that could be taken to determine an appropriate volume of advanced biofuel for 2014. We believe that Option 3 best addresses the dual concerns of constraints on ethanol supply and consumption and limited availability of advanced biofuels while also effectuating Congress's intention that the volume requirement for advanced biofuel continues to grow.

a. Option 1: Advanced Biofuel Availability

The RFS volume requirements that Congress established in CAA 211(o)(2)(B) increase steadily between 2009 and 2022. Over this period, the amount of total renewable fuel which is not advanced biofuel (largely corn starch based ethanol) was intended by Congress to grow slowly up to 15.0 bill gal in 2015, and then stay at that level for subsequent years. Cellulosic biofuel was intended to grow very dramatically, from 0.5 bill gal in 2012 to 16.0 bill gal in 2022. Non-cellulosic advanced biofuel was expected to grow steadily every year, increasing from 1.5 bill gal in 2012 to 5.0 bill gal in 2022. This anticipated growth of the advanced biofuel category is also evident from its increasing role as a component of the applicable volume of total renewable fuel, growing from 5.4% in 2009, to 20.7% in 2014, and 61.1% in 2022. Advanced biofuel must meet a GHG reduction threshold of 50%, compared to a 20% threshold for non-



advanced renewable fuel.<sup>94</sup> Thus, increased substitution of advanced biofuels for fossil fuels would result in lower lifecycle GHG emissions from transportation fuels.

In previous rulemakings where we considered reductions in the applicable annual volume of advanced biofuel following a reduction in the statutory volume for cellulosic biofuel, we focused on the availability of advanced biofuel (and in some cases available carryover RINs) when making determinations as to whether a reduction in advanced biofuel volumes was warranted. Using availability to set the applicable volume of advanced biofuel for 2014 and beyond would be consistent with past practice, and would reflect placing sole emphasis on its availability and the growth in advanced biofuels that results. However, the approach we used in previous annual rulemakings was based on the circumstances in previous years. In particular, supply concerns related to the legal constraints on the amount of ethanol that can be blended into gasoline and practical constraints on the volume of ethanol that can be consumed were not a limiting factor in previous years and so were not discussed as a potential basis for determining volumes. As discussed in Section IV.B.1 above, constraints on ethanol consumption are a limiting factor in 2014.

Moreover, using availability as the sole basis for determining advanced biofuel volumes would ignore the impact that ethanol within the advanced biofuel category have on the supply concerns related to constraints on ethanol consumption in blends higher than E10. While the available volume of advanced biofuel would be predominantly non-ethanol, a substantial volume

---

<sup>94</sup> Renewable fuels grandfathered under the provisions of §80.1403 are not required to meet any GHG threshold.

would be ethanol.<sup>95</sup> For an advanced biofuel availability of 2.49 - 3.23 bill gal (see Figure IV.C.1.e-1), the fraction that is ethanol ranges from an average of about 18% at the low end of the range to an average of about 25% at the high end of the range. Since any advanced biofuel that is ethanol contributes to the concerns related to total ethanol consumption, it is appropriate to consider reductions in the required volume of advanced biofuel beyond the 0.52 - 1.26 bill gal reduction needed to ensure that the volume required is available.

For these reasons, we invite comment on the Option 1 approach but are not proposing it.

b. Option 2: Full Reduction in Cellulosic Biofuel

Under the cellulosic waiver authority we have the discretion to reduce advanced biofuel by up to the same amount that we reduce cellulosic biofuel. Thus, a second option would be to reduce the advanced biofuel volume by the same amount that we reduce the cellulosic biofuel volume. Our proposed cellulosic biofuel volume requirement of 8 - 30 mill gal for 2014 corresponds to a reduction of 1,720 - 1,742 mill gal in comparison to the statutory volume of 1,750 mill gal. This is approximately twice the size of the reduction in advanced biofuel that would result from accounting for availability alone, as in Option 1, and would result in an advanced biofuel volume requirement of 2,008 - 2,030 mill gal.

---

<sup>95</sup> While production volumes of ethanol that can qualify as an advanced biofuel, both domestically and internationally are significant, consumption of this fuel will be constrained

A reduction of 1,720 - 1,742 mill gal in the advanced biofuel requirement would allow for overall growth in non-cellulosic advanced biofuel, consistent with overall levels of non-cellulosic advanced biofuels that Congress specified for 2014 in 211(o)(2)(B). The table below shows that this approach would ensure that the required volume of non-cellulosic advanced biofuel - comprised of biomass-based diesel and other advanced biofuel - that would be needed to meet the requirements would remain at 2.0 bill gal, the same volume that would have been needed to meet the statutory level of 3.75 bill gal of advanced biofuel if 1.75 bill gal of cellulosic biofuel were available.<sup>96</sup>

---

<sup>96</sup> The 2.0 bill gal is composed of the proposed volume of biomass-based diesel, 1.92 bill gallons ethanol equivalent, and the remaining volume of non-cellulosic advanced biofuel, 0.08 bill gallons.

Table IV.C.2.b-1

Impact on Other Advanced Biofuel of Reducing the Advanced Biofuel Requirement by an Amount Equal to the Reduction in Cellulosic Biofuel (million ethanol-equivalent gallons)

	Required volumes without a reduction in cellulosic biofuel or advanced biofuel	Required volumes with a reduction in advanced biofuel equal to reduction in cellulosic
Cellulosic biofuel	1,750	17
Biomass-based diesel <sup>a</sup>	1,920	1,920
Other advanced biofuel <sup>b</sup>	80	80
Total advanced biofuel	3,750	2,017

<sup>a</sup> Represents a physical volume of 1.28 bill gal biodiesel.

<sup>b</sup> Can include biomass-based diesel with a D code of 4 that is in excess of that required to meet the biomass-based diesel requirement of 1.28 bill gal, as well as any other forms of advanced biofuel with a D code of 5 such as renewable diesel, heating oil, biogas, and imported sugarcane ethanol.

This approach to setting the advanced biofuel volume requirement would minimize the impact of the advanced biofuel category on the supply problems associated with constraints on ethanol consumption. However this approach would ignore the availability of non-cellulosic advanced biofuel to fill the shortfall in cellulosic biofuel. It would reduce the market opportunities for other advanced biofuels (as compared to the other options), and thereby hinder the development of advanced biofuels that might otherwise help to meet the broader energy security and GHG reduction goals of Congress for the RFS program. Finally, as discussed below, this approach would result in greater reductions in advanced biofuel than are needed to

account for the contribution of ethanol advanced biofuels to the blendwall. For these reasons, we invite comment on this approach but are not proposing it.

c. Option 3: Availability, Growth, and Limits on Ethanol Consumption

Neither Option 1 nor Option 2 address all the factors we believe are important in the determination of the applicable advanced biofuel volume requirement. For instance, under Option 1 (using just availability to determine the appropriate volume of advanced biofuel), the significant impacts of constraints on ethanol consumption and the factors leading to a reduction in the total volume of renewable fuel would not be reflected at all in our determination of the advanced biofuel requirement. On the other hand, under Option 2 (reducing the advanced biofuel requirement by the same amount that we reduce cellulosic biofuel), would impose unnecessary constraints on non-ethanol advanced biofuels even though they do not contribute to the constraints on the volume of ethanol that can reasonably be consumed.

For these reasons we are proposing a third option that would address these issues by first summing the applicable volume requirements for cellulosic biofuel and biomass-based diesel, and then adding available volumes of non-ethanol advanced biofuel, including any biodiesel in excess of the 1.28 bill gal requirement as well as other available non-ethanol advanced biofuels such as renewable diesel, heating oil, and biogas. Under this approach, we consider only non-ethanol sources of advanced biofuel as these fuels are not limited by their ability to be consumed as are ethanol blends. This approach would help to ensure that the advanced biofuel requirement

would include all available volumes of advanced biofuel which do not contribute to the supply concerns related to constraints on ethanol consumption. It would also provide for additional growth in volumes of advanced biofuel that would otherwise be lost due to the shortfall in cellulosic biofuel. Once the advanced biofuel volume requirement was set, the market would determine which advanced biofuels would be produced and sold to meet the advanced biofuel requirement, including whether they would be ethanol or non-ethanol. Thus under this approach we would not be mandating or determining what renewable fuels would in fact be produced and sold.

We once again used a Monte Carlo approach to aggregate the ranges for cellulosic biofuel, biomass-based diesel, and non-ethanol advanced biofuel. The ranges and standardized distributions we used in this process are shown in Table IV.C.2.c-1, and the resulting distribution for advanced biofuel is shown in Figure IV.C.2.c-1.

Table IV.C.2.c-1

Proposed Volume Ranges for Estimating Advanced Biofuel Requirement for 2014

(million ethanol-equivalent gallons)

Proposed requirement for cellulosic biofuel	8 - 30	Combined <sup>a</sup>
Proposed requirement for biomass-based diesel	1,920 <sup>b</sup>	n/a
Available volumes of excess biomass-based diesel	0 - 480 <sup>c</sup>	Half-normal
Available volumes of domestic non-ethanol advanced biofuel	24 - 132	Normal

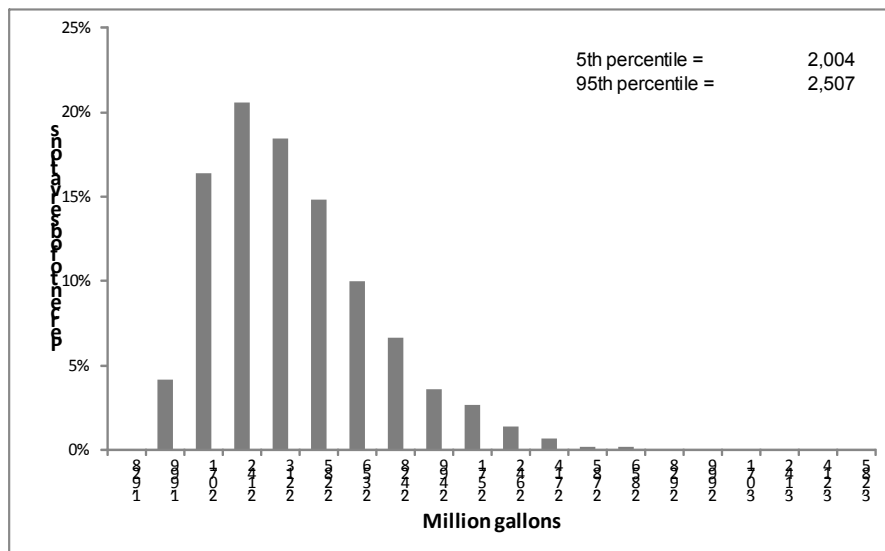
<sup>a</sup> As described in Section II.C, this distribution is a combination of the distributions for all facilities projected to produce cellulosic biofuel.

<sup>b</sup> Represents a physical volume of 1.28 bill gal

<sup>c</sup> Represents a physical volume range of 0 - 320 mill gal

Figure IV.C.2.c-1

Results of Monte Carlo Simulation for Advanced Biofuel Requirement





For the reasons discussed above, we propose that the advanced biofuel volume requirement would be set based on the Option 3 approach, within the range of 2.00 - 2.51 bill gal. Given that the volume requirement in the statute is 3.75 bill gal, this proposed range of advanced biofuel would represent a reduction of 1.24 - 1.75 bill gal. In comparison, the reduction in cellulosic biofuel that we are proposing in today's NPRM is 1.72 - 1.74 bill gal, and the reduction in total renewable fuel that we are proposing is 2.63 - 3.15 bill gal. The Option 3 approach to setting the advanced biofuel volume requirement would generate a volume that falls approximately midway between Options 1 and 2 for 2014.

The approach we are proposing in today's NPRM is based upon and fully consistent with the authorities provided in the statute for waiving volumes. The proposed reductions in the volumes of advanced biofuel and total renewable fuel derive from our determination that the industry and market will be unable to supply sufficient volumes in 2014 to meet the statutory mandates, either because of projected limitations in production and importation of qualifying renewable fuels, or projected limitations in the available infrastructure to ensure that those fuels are supplied to and consumed in the transportation sector. All of these limitations represent forms of inadequate supply and are permissible bases for exercising both the general waiver authority and the cellulosic waiver authority.

As for the required volume of total renewable fuel, there are a variety of ways in which a specific value within the proposed range can be chosen for the volume of advanced biofuel that we require in the final rule. The table below shows the values that correspond to the distribution in Figure IV.C.2.c-1 using several possible approaches.

Table IV.C.2.c-2

Potential Approaches to Determining the  
Final Advanced Biofuel Volume Requirement  
(million ethanol-equivalent gallons)

Mean	2,202
Mode	2,099
25th percentile	2,086
50th percentile	2,178
75th percentile	2,289

In today's NPRM we are proposing to use the mean value of 2,202 mill gal for the volume requirement for advanced biofuel because we believe it best represents a neutral aim at advanced biofuel volumes that could reasonably be supplied. However, we request comment on whether one of the alternative values shown in Table IV.C.2.c-2, or some other approach, would be more appropriate as the basis for the required volume of advanced biofuel in the final rule.

*D. Summary of Proposed Volume Requirements for 2014*

For the reasons discussed above, we are proposing the volumes of total renewable fuel and advanced biofuel as shown below.

Table IV.D-1

## Proposed Volumes for 2014 (billion gallons)

	Statutory volume	Proposed volume	
		Range	Mean
Advanced biofuel	3.75	2.00 - 2.51	2.20
Total renewable fuel	18.15	15.00 - 15.52	15.21

For the final rule, we may revise the ranges based on additional information that becomes available after publication of this NPRM. This information could include more recent Production Outlook Report required under §80.1449, production and consumption data for 2013, and information from stakeholders.

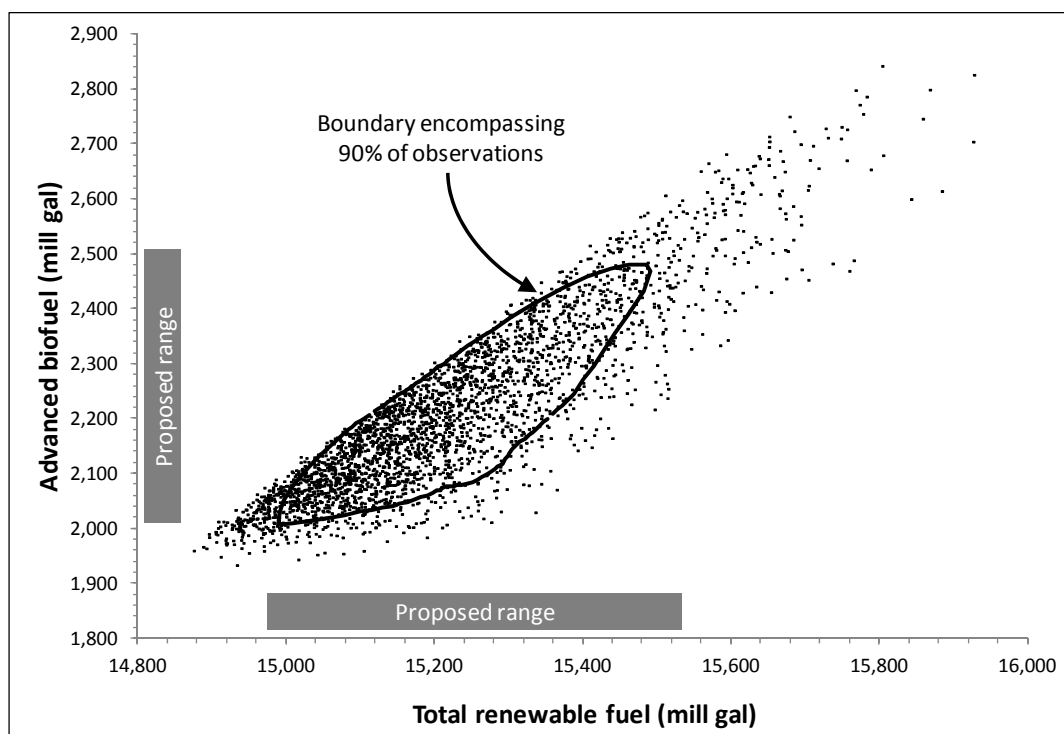
With regard to the mean, we request comment on whether it is the most appropriate way to determine the volume within each of the ranges that we would require in the final rule, or whether instead one of the alternatives shown in Tables IV.B.4-3 or IV.C.2.c-2, or some other approach, would be more appropriate. Nevertheless, as described above, we do not believe that using either the low end or high end of the proposed ranges would be appropriate as the basis for the applicable standards. A value between the low and high ends would better account for cases in which the actual values for some of the input volumes fall at the high end of their respective ranges while the actual value of other input volumes fall at the low end of their ranges.

We note that the two ranges shown in Table IV.D-1 were not independently derived and thus cannot be treated independently from one another in the determination of the appropriate

volumes to finalize. Many of the same ranges of biofuel availability that were used in estimating the range of total renewable fuel were also used in estimating the range of advanced biofuel. This fact can be seen in the distribution of results from the Monte Carlo process, which shows a distinct correlation between total renewable fuel and advanced biofuel.

Figure IV.D-1

Results of Monte Carlo Process for Both Total Renewable Fuel and Advanced Biofuel



Because of this correlation, decisions for both total renewable fuel and advanced biofuel need to take this relationship into account. For example, it would not be appropriate to finalize a volume for total renewable fuel that is at the high end of its proposed range, while also finalizing a volume for advanced biofuel that is at the low end of its proposed range. Doing so would result

in a demand for renewable fuels that either could not be filled with available volumes or could not reasonably be consumed.

The ranges that we are proposing for advanced biofuel and total renewable fuel determine the range of non-advanced renewable fuel that would be needed. The majority of non-advanced renewable fuel is ethanol made from corn starch, though as discussed in Section IV.B.2.d we would also expect some non-ethanol renewable fuel as well, in the range of 1 - 25 mill gal. Taking this non-ethanol renewable fuel into account, we used the results of the Monte Carlo process that generated the ranges shown in Table IV.D-1 to determine that the volume of corn-ethanol that would be needed would be 12.94 - 13.07 bill gal. This range represents an increase in comparison to 2012 corn-ethanol consumption, which was about 12.5 bill gal.<sup>97</sup> While this range represents a reduction in comparison to the statutory volumes for 2014, it nonetheless represents an increase relative to projected 2013 corn-ethanol consumption of about 12.3 bill gal.<sup>98</sup> For comparison, this reduction in corn-ethanol volume for 2014 is about 90% of the size of the proposed reduction in advanced biofuel. Thus under our proposed approach, both non-advanced renewable fuels and advanced biofuels are contributing to the necessary reductions needed to attain renewable fuel volumes that can reasonably be supplied and consumed. We request comment on our proposed approach and on alternative approaches that may be applied to determine how best to allocate adjustments needed to address the constraints of both the ethanol blendwall and limitations in the availability of non-ethanol biofuels.

---

<sup>97</sup> EIA Monthly Energy Review for June 2013, Table 10.3. Corn-ethanol exports were about 740 mill gal in 2012 based on EIA Exports By Destination.

<sup>98</sup> EIA AEO2013, Table 17. Assumes corn-ethanol exports of 885 mill gal per EIA.

*E. Volume Requirements for 2015 and Beyond*

In enacting the RFS program, Congress anticipated and intended to promote substantial, sustained growth in biofuel production and consumption – beyond the levels that have been achieved to date – though it did so in the context of forecasts of continually growing transportation fuel consumption. As explained in Section IV.B, gasoline demand has declined in the years since EISA was enacted in 2007 and is projected to continue to do so. As a result, the gasoline pool will be able to absorb about 2.3 bill gal less ethanol as E10 in 2014 than it would have been possible to absorb if the gasoline use projection in AEO2007 had been realized. While we recognize this change in circumstances, we continue to support the objective of continued growth in renewable fuel production and consumption, as well as the central policy goals underlying the RFS program: reductions in greenhouse gas emissions, enhanced energy security, economic development, and technological innovation. We recognize that the issues concerning availability of qualifying renewable fuels and the consumption of ethanol that are discussed above with respect to the 2014 RFS standards will continue to be relevant in 2015 and beyond. Our objective in this rulemaking is to develop a general approach for determining appropriate volume requirements that can be applied not only to 2014, but also for 2015 and beyond. Any such approach would, of course, fully consider comments received in response to this NPRM and would account for new and improved data and changes in relevant circumstances over time. As we have underscored throughout this proposal, we look forward to engagement with stakeholders on all relevant aspects of the proposed approach.

We believe that the general approach reflected in today's proposal is consistent with the goals of the underlying statute and will put the RFS program on a manageable trajectory while supporting continued growth in renewable fuels over time. In future years, we would expect to use the most recently available information to update the analyses used to project volumes in each of these areas:

- Volume of ethanol that could be consumed, including reasonably achievable growth in capacity to consume higher ethanol blends such as E15 and E85
- Available volumes of cellulosic biofuel
- Available volumes of biomass-based diesel
- Available volumes of advanced biofuel
- Available volumes of non-advanced renewable fuel
- Amount of carryover RINs

In addition to these factors, the approach we are proposing today would also account for changes in circumstances over time, including the substantial efforts underway to increase the volume of biofuel produced and consumed in the United States. Many companies are continuing to invest in efforts ranging from research and development to the construction of commercial scale facilities to increase the production potential of next generation biofuels. Many of these projects have received financial support from government agencies:

- DOE's ARPA-E program, which aims to advance high-potential, high-impact energy technologies that are too early for private sector investment, and DOE's Integrated

Biorefinery Program, which provides grants and works in partnership with industry to develop, build, operate, and validate integrated biorefineries at various scales at locations across the country.<sup>99</sup> DOE invests more than \$200 million annually on technology development aimed at enabling cost-competitive advanced biofuels, including cellulosic ethanol, renewable gasoline, diesel, and aviation fuel. DOE has also awarded over \$1 billion since 2007 for 27 integrated biorefinery projects intended to de-risk first-of-a-kind technologies at pilot, demonstration, and commercial scale.

- USDA's Biorefinery Assistance Program, which provides loan guarantees for the development and construction of commercial scale biorefineries, is another example.<sup>100</sup> Many of these new projects are focused on producing non-ethanol fuels, including bio-based hydrocarbons (gasoline, diesel, and jet fuel), gaseous fuels (CNG and LNG), or more energy-dense alcohols such as butanol.
- President Obama's directive to USDA, DOE, and the Navy to collaborate with the private sector to spur a "drop-in" biofuels industry to meet the transportation needs of the Department of Defense (DOD) and the private sector. This multi-agency effort potentially establishes the federal government as an early market adopter of these biofuels, demonstrating their potential bankability for commercial markets. DOD made four \$5M, 18-month phase 1 awards in June 2013. Successful projects will be

---

<sup>99</sup> For more information on these programs visit their websites at: <http://arpa-e.energy.gov/> and [http://www1.eere.energy.gov/bioenergy/integrated\\_biorefineries.html](http://www1.eere.energy.gov/bioenergy/integrated_biorefineries.html)

<sup>100</sup> On October 21<sup>st</sup> USDA announced that an additional \$181 million would be available through the Biorefinery Assistance Program. For more information visit the program's website at: and [http://www.rurdev.usda.gov/BCP\\_Biorefinery.html](http://www.rurdev.usda.gov/BCP_Biorefinery.html)



selected to go on to Phase II construction to be jointly supported by the three agencies in the beginning of fiscal year 2015.

In addition to these efforts at other agencies, EPA is currently evaluating a number of new pathways to allow these fuels to generate RINs under the RFS program if the applicable feedstock, fuel type, and greenhouse gas reduction requirements are met. As these new fuels and fuel volumes come online, the proposed methodology will automatically incorporate them into the development of the standards for the following year.

Simultaneously, efforts are underway to increase the availability, awareness, and acceptance of gasoline fuel blends containing greater than 10 percent ethanol as expanded consumption of this fuel could play a role in the future. For instance, EPA has taken a series of regulatory steps to enable E15 to be sold in the U.S. In 2010 and 2011, EPA issued partial waivers to enable use of E15 in model year 2001 and newer vehicles, and in June of 2011, EPA finalized regulations to prevent misfueling of vehicles, engines, and equipment not covered by the partial waiver decisions. Other federal and state agencies have also taken steps to help foster the inclusion of E15 in the marketplace. We recognize that there remain a number of obstacles to increased E15 consumption. We request comment on what actions, on the part of government as well as industry and other stakeholders, could be taken to overcome these obstacles and to enable E15 consumption to increase.

With regard to E85, the portion of the estimated 11.5 million FFV fleet (in 2013)<sup>101</sup> having reasonable access to the existing E85 retail infrastructure (approximately 3,000 stations

---

<sup>101</sup> EIA Annual Energy Outlook 2013, Table 40. Sum of Ethanol-Flex Fuel ICE Cars and Light Trucks

nationwide) represents a potential market of over 1 bill gal of E85 consumption.<sup>102</sup> While there are many factors that may contribute to a customer's choice of which fuel to purchase, a recent study by the National Association of Convenience Stores found that for 71% of customers, price was the most important factor in their decision on where to purchase their fuel.<sup>103</sup> Historically, E85 has been more expensive than E10 on an energy-content adjusted basis which has likely been a key factor in the low sales volumes. Recent data collected by EIA suggests that at least in some parts of the country the price relationship between E10 and E85 may be changing. In a *Today in Energy* article published on September 19, 2013, EIA presented data showing that in a collection of Midwestern states E85 retail prices were less than E10 retail prices on an energy-content adjusted basis in July 2013, the most recent month for which information was available.<sup>104</sup> This change in price relationship between E10 and E85 coincides with reported increases in sales volumes of E85 in Iowa and Minnesota, two states in which E85 sales volumes are publically available.<sup>105</sup> If the conditions that have led to this price relationship continue in the future, E85 sales volumes are likely to continue to increase.

In addition to the potential for increased consumption of E85 when considering the existing infrastructure and vehicle fleet, there is also substantial opportunity to increase ethanol consumption in higher level ethanol blends through growth in the FFV fleet and E85 infrastructure. The number of stations offering E85 is currently increasing at a rate of

---

<sup>102</sup> Memorandum from David Korotney to EPA docket EPA-HQ-OAR-2013-0479.

<sup>103</sup> 2013 NACS Retail Fuels Report

<sup>104</sup> "E85 motor fuel is increasingly price-competitive with gasoline in parts of the Midwest." *Today in Energy*. EIA, 19 September 2013. <<http://www.eia.gov/todayinenergy/detail.cfm?id=13031>>. Study compared daily average observed E85 and regular gasoline prices at the same stations in the states of Iowa, Illinois, Indiana, Kentucky, Michigan, Minnesota, and Ohio.

<sup>105</sup> See Table IV.B.1-2

approximately 300 new stations per year.<sup>106</sup> In 2012 USDA announced a goal to help retail station owners install as many as 10,000 ethanol blender pumps by 2017.<sup>107</sup> Growth Energy has a “Blend Your Own Ethanol” program to encourage the installation of ethanol blender pumps. These efforts, combined with the potential for these higher level ethanol blends to decrease consumer fuel costs in the future under appropriate market circumstances, could lead to a significant increase in the amount of ethanol than can be consumed as a transportation fuel in the United States in future years. As a benchmark, if every FFV currently in the fleet had access to E85 and chose to use it exclusively, the total consumption of these vehicles would be approximately 8 bill gal per year. The size of the FFV vehicle fleet also continues to increase, and is expected to grow by approximately 1 million vehicles from 2013 to 2014, with sales recently in excess of 2 million vehicles per year.<sup>108 109</sup> EPA’s recently proposed credit for vehicle manufacturers under the light-duty greenhouse gas standards could help encourage the continuation such sales into the future.<sup>110</sup> Ongoing growth in the size of the FFV fleet and the number of E85 pumps could be accelerated by increases in demand from customers for E85 fuel, which has the potential to support a rapid growth in E85 infrastructure. Under the proposed framework for the 2014 standards, any such growth in capacity for ethanol consumption would continuously be reflected in the standards set for the following year.

At the same time, we recognize that a number of challenges must be overcome in order to fully realize the potential for higher levels of production and consumption of higher-level ethanol

---

<sup>106</sup> Memorandum from David Korotney to EPA docket EPA-HQ-OAR-2013-0479.

<sup>107</sup> <http://www.usda.gov/wps/portal/usda/usdamediafb?contentid=2012/05/0141.xml>

<sup>108</sup> EIA Alternative Fuel Vehicle Data Report. Released May 4, 2012.

<sup>109</sup> EIA Annual Energy Outlook 2013, Table 40. Increase in Ethanol-Flex Fuel Cars and Light Trucks from 2013 to 2014.

<sup>110</sup> Draft Guidance Letter, CD-13-XX (LD), "E85 Flexible Fuel Vehicle Weighting Factor for Model Year 2016-2019 Vehicles" <http://epa.gov/otaq/regs/ld-hwy/greenhouse/ld-ghg.htm#action>

blends and of renewable fuels generally in the United States. We also recognize that, while the RFS program is a central element of our domestic biofuels policy, a range of other tools, programs, and actions have the potential to play an important complementary role. We request comment on what actions could be taken by various industry and other private stakeholders, as well by the government, to help overcome these challenges and to minimize the need for adjustments in the statutory renewable fuel volume requirements in the future.

## **V. Proposed Percentage Standards for 2014**

### *A. Background*

The renewable fuel standards are expressed as volume percentages and are used by each refiner or importer to determine their RVO. Since there are four separate standards under the RFS2 program, there are likewise four separate RVOs applicable to each obligated party. Each standard applies to the sum of all gasoline and diesel produced or imported. The applicable percentage standards are set so that if every obligated party meets the percentages, then the amount of renewable fuel, cellulosic biofuel, biomass-based diesel, and advanced biofuel used will meet the volumes required on a nationwide basis.

As discussed in Section II.C, we are proposing a required volume of cellulosic biofuel for 2014 of 17 million ethanol-equivalent gallons. The volume we select for the final rule will be used as the basis for setting the percentage standard for cellulosic biofuel for 2014. We are also

proposing to reduce the advanced biofuel and total renewable fuel volumes. The biomass-based diesel volume for 2014 has been proposed to be maintained at 1.28 billion gallons. The volumes to be used to determine the four proposed percentage standards are shown in Table V.A-1.

Table V.A-1

Proposed Volumes for Use in Setting the Applicable Percentage Standards for 2014<sup>a</sup>

Cellulosic biofuel	17 mill gal
Biomass-based diesel	1.28 bill gal
Advanced biofuel	2.20 bill gal
Renewable fuel	15.21 bill gal

<sup>a</sup> Due to the manner in which the percentage standards are calculated, all volumes are given in terms of ethanol-equivalent except for biomass-based diesel which is given in terms of physical volume

As with previous years' renewable fuels standards determination, the formulas used in deriving the annual standards are based in part on estimates of the volumes of gasoline and diesel fuel, for both highway and nonroad uses, that are projected to be used in the year in which the standards will apply. Producers of other transportation fuels, such as natural gas, propane, and electricity from fossil fuels, are not subject to the standards, and volumes of such fuels are not used in calculating the annual standards. Since the standards apply to producers and importers of gasoline and diesel, these are the transportation fuels used to set the standards, and then again to determine the annual volume obligations of an individual gasoline or diesel producer or importer.

*B. Calculation of Standards*

1. How Are the Standards Calculated?

The following formulas are used to calculate the four percentage standards applicable to producers and importers of gasoline and diesel (see §80.1405):

$$\text{Std}_{\text{CB}, i} = 100\% \times \frac{\text{RFV}_{\text{CB}, i}}{(G_i - RG_i) + (GS_i - RGS_i) - GE_i + (D_i - RD_i) + (DS_i - RDS_i) - DE_i}$$

$$\text{Std}_{\text{BBD}, i} = 100\% \times \frac{\text{RFV}_{\text{BBD}, i} \times 1.5}{(G_i - RG_i) + (GS_i - RGS_i) - GE_i + (D_i - RD_i) + (DS_i - RDS_i) - DE_i}$$

$$\text{Std}_{\text{AB}, i} = 100\% \times \frac{\text{RFV}_{\text{AB}, i}}{(G_i - RG_i) + (GS_i - RGS_i) - GE_i + (D_i - RD_i) + (DS_i - RDS_i) - DE_i}$$

$$\text{Std}_{\text{RF}, i} = 100\% \times \frac{\text{RFV}_{\text{RF}, i}}{(G_i - RG_i) + (GS_i - RGS_i) - GE_i + (D_i - RD_i) + (DS_i - RDS_i) - DE_i}$$

Where

$\text{Std}_{\text{CB}, i}$  = The cellulosic biofuel standard for year i, in percent.

$\text{Std}_{\text{BBD}, i}$  = The biomass-based diesel standard (ethanol-equivalent basis) for year i, in percent.

$\text{Std}_{\text{AB},i}$  = The advanced biofuel standard for year  $i$ , in percent.

$\text{Std}_{\text{RF},i}$  = The renewable fuel standard for year  $i$ , in percent.

$\text{RFV}_{\text{CB},i}$  = Annual volume of cellulosic biofuel required by section 211(o) of the Clean Air Act for year  $i$ , in gallons.

$\text{RFV}_{\text{BBD},i}$  = Annual volume of biomass-based diesel required by section 211(o) of the Clean Air Act for year  $i$ , in gallons.

$\text{RFV}_{\text{AB},i}$  = Annual volume of advanced biofuel required by section 211(o) of the Clean Air Act for year  $i$ , in gallons.

$\text{RFV}_{\text{RF},i}$  = Annual volume of renewable fuel required by section 211(o) of the Clean Air Act for year  $i$ , in gallons.

$G_i$  = Amount of gasoline projected to be used in the 48 contiguous states and Hawaii, in year  $i$ , in gallons.

$D_i$  = Amount of diesel projected to be used in the 48 contiguous states and Hawaii, in year  $i$ , in gallons. This value excludes diesel used in ocean-going vessels.

$RG_i =$  Amount of renewable fuel blended into gasoline that is projected to be consumed in the 48 contiguous states and Hawaii, in year  $i$ , in gallons.

$RD_i =$  Amount of renewable fuel blended into diesel that is projected to be consumed in the 48 contiguous states and Hawaii, in year  $i$ , in gallons.

$GS_i =$  Amount of gasoline projected to be used in Alaska or a U.S. territory in year  $i$  if the state or territory opts-in, in gallons.

$RGS_i =$  Amount of renewable fuel blended into gasoline that is projected to be consumed in Alaska or a U.S. territory in year  $i$  if the state or territory opts-in, in gallons.

$DS_i =$  Amount of diesel projected to be used in Alaska or a U.S. territory in year  $i$  if the state or territory opts-in, in gallons.

$RDS_i =$  Amount of renewable fuel blended into diesel that is projected to be consumed in Alaska or a U.S. territory in year  $i$  if the state or territory opts-in, in gallons.

$GE_i =$  Amount of gasoline projected to be produced by exempt small refineries and small refiners in year  $i$ , in gallons, in any year they are exempt per §§80.1441 and 80.1442, respectively. For 2014, this value is zero. See further discussion in Section V.B.2 below.



$DE_i =$  Amount of diesel projected to be produced by exempt small refineries and small refiners in year  $i$ , in gallons, in any year they are exempt per §§80.1441 and 80.1442, respectively. For 2014, this value is zero. See further discussion in Section V.B.2 below.

The four separate renewable fuel standards for 2014 are based on the gasoline and diesel consumption volumes projected by EIA. The Act requires EPA to base the standards on an EIA estimate of the amount of gasoline and diesel that will be sold or introduced into commerce for that year. The projected volumes of gasoline and diesel that will be used to calculate the final 2014 percentage standards will be provided to EPA by EIA. To estimate the gasoline and diesel projected volumes for the purposes of this proposal, we have used EIA's Short-Term Energy Outlook (STEO)<sup>111</sup> for the gasoline projection and EIA's Annual Energy Outlook 2013 Early Release<sup>112</sup> for the diesel projection. Gasoline and diesel volumes are adjusted to account for renewable fuel contained in the EIA projections. The projected volumes of ethanol and biodiesel used to calculate the final percentage standards will be provided to EPA by EIA. To estimate the ethanol and biodiesel projected volumes for the purposes of this proposal, we have used the values<sup>113</sup> for ethanol and biodiesel provided in the STEO. Using the most recent available EIA data for purposes of this proposal allows us to provide the affected industries with a reasonable estimate of the standards for planning purposes.

---

<sup>111</sup> Energy Information Administration/Short-Term Energy Outlook – September 2013, Table 4a, “U.S. Crude Oil and Liquid Fuels Supply, Consumption, and Inventories.”

<sup>112</sup> Energy Information Administration/Annual Energy Outlook 2013, April 2013, “Energy Consumption by Sector and Source, United States, Reference case; Transportation Distillate Fuel Oil.”

<sup>113</sup> Energy Information Administration/Short-Term Energy Outlook – September 2013, Table 8, “U.S. Renewable Energy Consumption (Quadrillion Btu).”

## 2. Small Refineries and Small Refiners

In CAA section 211(o)(9), enacted as part of the Energy Policy Act of 2005, Congress provided a temporary exemption to small refineries (those refineries with a crude throughput of no more than 75,000 barrels of crude per day) through December 31, 2010. In our initial rulemaking to implement the new RFS program,<sup>114</sup> we exercised our discretion under section 211(o)(3)(B) and extended this temporary exemption to the few remaining small refiners that met the Small Business Administration's (SBA) definition of a small business (1,500 employees or less company-wide) but did not meet the statutory small refinery definition as noted above.<sup>115</sup> Because EISA did not alter the small refinery exemption in any way, the RFS2 program regulations maintained the exemptions for gasoline and diesel produced by small refineries and small refiners through 2010 (unless the exemption was waived).<sup>116</sup>

Congress provided two ways that small refineries could receive a temporary extension of the exemption beyond 2010. One was based on the results of a study conducted by the Department of Energy (DOE) to determine whether small refineries would face a disproportionate economic hardship under the RFS program. In March of 2011, DOE evaluated the impacts of the RFS program on small entities and concluded that some small refineries would

---

<sup>114</sup> 72 FR 23900, May 1, 2007.

<sup>115</sup> 40 CFR §§ 80.1141, 80.1142.

<sup>116</sup> See 40 CFR §§ 80.1441, 80.1442.

suffer a disproportionate hardship.<sup>117</sup> The other way that small refineries could receive a temporary extension is based on EPA determination of disproportionate economic hardship on a case-by-case basis in response to refiner petitions.<sup>118</sup> EPA has granted some exemptions pursuant to this process, as recently as 2013. However, at this time, no exemptions have been approved for 2014. Therefore, for this proposal we have calculated the 2014 standards without a small refinery/small refiner adjustment.

However, if an individual small refinery or small refiner requests an exemption and is approved prior to issuance of the final rule, the final standards will be adjusted to account for the exempted volumes of gasoline and diesel. Any requests for exemptions that are approved after the release of the final 2014 RFS standards will not affect the 2014 standards. As stated in the final rule establishing the 2011 standards, “EPA believes the Act is best interpreted to require issuance of a single annual standard in November that is applicable in the following calendar year, thereby providing advance notice and certainty to obligated parties regarding their regulatory requirements. Periodic revisions to the standards to reflect waivers issued to small refineries or refiners would be inconsistent with the statutory text, and would introduce an undesirable level of uncertainty for obligated parties.” Thus, after the 2014 standards are finalized, any additional exemptions for small refineries or small refiners that are issued will not affect those 2014 standards.

---

<sup>117</sup> "Small Refinery Exemption Study: An Investigation into Disproportionate Economic Hardship," U.S. Department of Energy, March 2011.

<sup>118</sup> 40 CFR §§ 80.1441(e)(2), 80.1442(h).

### 3. Proposed Standards

As specified in the March 26, 2010 RFS2 final rule,<sup>119</sup> the percentage standards are based on energy-equivalent gallons of renewable fuel, with the cellulosic biofuel, advanced biofuel, and total renewable fuel standards based on ethanol equivalence and the biomass-based diesel standard based on biodiesel equivalence. However, all RIN generation is based on ethanol-equivalence. For example, the RFS2 regulations provide that production or import of a gallon of qualifying biodiesel will lead to the generation of 1.5 RINs. In order to ensure that demand for 1.28 billion physical gallons of biomass-based diesel will be created in 2014, the calculation of the biomass-based diesel standard provides that the required volume be multiplied by 1.5. The net result is a biomass-based diesel gallon being worth 1.0 gallon toward the biomass-based diesel standard, but worth 1.5 gallons toward the other standards.

The levels of the percentage standards would be reduced if Alaska or a U.S. territory chooses to participate in the RFS2 program, as gasoline and diesel produced in or imported into that state or territory would then be subject to the standard. Neither Alaska nor any U.S. territory has chosen to participate in the RFS2 program at this time, and thus the value of the related terms in the calculation of the standards is zero.

Note that because the gasoline and diesel volumes estimated by EIA include renewable fuel use, we must subtract the total renewable fuel volumes from the total gasoline and diesel volumes to get total non-renewable gasoline and diesel volumes. The values of the variables

---

<sup>119</sup> 75 FR 14716, March 26, 2010.

described above are shown in Table V.B.3-1.<sup>120</sup> Terms not included in this table have a value of zero.

Table V.B.3-1

Values for Terms in Calculation of the Standards<sup>121</sup> (bill gal)

Term	Value
$RFV_{CB,2014}$	0.017
$RFV_{BBD,2014}$	1.28
$RFV_{AB,2014}$	2.20
$RFV_{RF,2014}$	15.21
$G_{2014}$	132.65
$D_{2014}$	47.12
$RG_{2014}$	13.12
$RD_{2014}$	1.38

Using the volumes shown in Table V.B.3-1, we have calculated the proposed percentage standards for 2014 as shown in Table V.B.3-2.

<sup>120</sup> To determine the 49-state values for gasoline and diesel, the amounts of these fuels used in Alaska is subtracted from the totals provided by DOE. The Alaska fractions are determined from the most recent EIA State Energy Data System (SEDS), Energy Consumption Estimates.

<sup>121</sup> U.S. Gasoline (October 2013 STEO)=8.67 MMbbl/day; U.S. Ethanol (October 2013 STEO)=0.858 MMBD calculated as 1.115 QBtu; U.S. Transportation Distillate (AEO2013)=6.55 QBtu; U.S. Biodiesel (October 2013 STEO)=0.09 MMBD calculated as 0.176 QBtu; U.S. Diesel Ocean-going vessels (AEO2013)= 52.429TBtu; Alaska (SEDS 2011): AK Gasoline=6.321 MMbbl, AK Ethanol=0.733 MMbbl; AK Diesel=7.621 MMbbl, AK Biodiesel=0, AK Ocean-going vessels estimated at 4.5% of U.S. vessel bunkering and applied to the U.S. ocean-going vessel volume.

Table V.B.3-2

Proposed Percentage Standards for 2014

Cellulosic biofuel	0.010%
Biomass-based diesel	1.16%
Advanced biofuel	1.33%
Renewable fuel	9.20%

## **VI. Public Participation**

We request comment on all aspects of this proposal. This section describes how you can participate in this process.

### *A. How Do I Submit Comments?*

We are opening a formal comment period by publishing this document. We will accept comments during the period indicated under the **DATES** section above. If you have an interest in the proposed standards, we encourage you to comment on any aspect of this rulemaking. We also request comment on specific topics identified throughout this proposal.

Your comments will be most useful if you include appropriate and detailed supporting rationale, data, and analysis. Commenters are especially encouraged to provide specific suggestions for any changes that they believe need to be made. You should send all comments, except those containing proprietary information, to our Air Docket (see **ADDRESSES** section above) by the end of the comment period.

You may submit comments electronically, by mail, or through hand delivery/courier. To ensure proper receipt by EPA, identify the appropriate docket identification number in the subject line on the first page of your comment. Please ensure that your comments are submitted within the specified comment period. Comments received after the close of the comment period

will be marked “late.” EPA is not required to consider these late comments. If you wish to submit Confidential Business Information (CBI) or information that is otherwise protected by statute, please follow the instructions in Section VI.B below.

*B. How Should I Submit CBI to the Agency?*

Do not submit information that you consider to be CBI electronically through the electronic public docket, [www.regulations.gov](http://www.regulations.gov), or by e-mail. Send or deliver information identified as CBI only to the following address: U.S. Environmental Protection Agency, Assessment and Standards Division, 2000 Traverwood Drive, Ann Arbor, MI, 48105, Attention Docket ID EPA-HQ-OAR-2013-0479. You may claim information that you submit to EPA as CBI by marking any part or all of that information as CBI (if you submit CBI on disk or CD ROM, mark the outside of the disk or CD ROM as CBI and then identify electronically within the disk or CD ROM the specific information that is CBI). Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2.

In addition to one complete version of the comments that include any information claimed as CBI, a copy of the comments that does not contain the information claimed as CBI must be submitted for inclusion in the public docket. If you submit the copy that does not contain CBI on disk or CD ROM, mark the outside of the disk or CD ROM clearly that it does not contain CBI. Information not marked as CBI will be included in the public docket without



prior notice. If you have any questions about CBI or the procedures for claiming CBI, please consult the person identified in the **FOR FURTHER INFORMATION CONTACT** section.

## **VII. Statutory and Executive Order Reviews**

### *A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review*

This action is a “significant regulatory action” as set forth under Executive Order 12866 (58 FR 51735, October 4, 1993). Accordingly, EPA submitted this action to the Office of Management and Budget (OMB) for review under Executive Orders 12866 and 13563 (76 FR 3821, January 21, 2011) and any changes made in response to OMB recommendations have been documented in the docket for this action. A determination has not been reached, however, with regard to whether this action is “economically significant” under Executive Order 12866. Such a determination will be made for the final rule.

The economic impacts of the RFS2 program on regulated parties, including the impacts of the volumes of renewable fuel specified in the statute, were analyzed in the RFS2 final rule promulgated on March 26, 2010 (75 FR 14670). With the exception of biomass-based diesel, this action proposes standards applicable in 2013 that would be reduced from those analyzed in the RFS2 final rule. The impacts of the proposed 2014 and 2015 volumes of biomass-based diesel were addressed in the final rule establishing the 2013 volume requirement of 1.28 bill gal (77 FR 59458).

### *B. Paperwork Reduction Act*

There are no new information collection requirements associated with the standards in this notice of proposed rulemaking. The standards being proposed today would not impose new or different reporting requirements on regulated parties. The existing information collection requests (ICR) that apply to the RFS program are sufficient to address the reporting requirements in the regulations.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR part 9.

### *C. Regulatory Flexibility Act*

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedures Act or any other statute unless the agency certifies that the rulemaking will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of today's proposed rule on small entities, small entity is defined as: (1) a small business as defined by the Small Business Administration's

(SBA) regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of today's proposed rule on small entities, we certify that this proposed action will not have a significant economic impact on a substantial number of small entities. This rulemaking proposes that the annual volume requirement for cellulosic biofuel for 2014 would be reduced from the statutory volume of 1.75 bill gal. We are also proposing to reduce the annual volume requirements for advanced biofuel and total renewable fuel. The impacts of the RFS2 program on small entities were already addressed in the RFS2 final rule promulgated on March 26, 2010 (75 FR 14670), and this proposed rule will not impose any additional requirements on small entities beyond those already analyzed. However, we continue to be interested in the potential impacts of the proposed rule on small entities and welcome comments on issues related to such impacts.

#### *D. Unfunded Mandates Reform Act*

This proposed action contains no Federal mandates under the provisions of Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), 2 U.S.C. 1531-1538 for State, local, or tribal governments or the private sector. This action implements mandate(s) specifically and explicitly set forth by the Congress in Clean Air Act section 211(o) without the exercise of any policy

discretion by EPA. Therefore, this action is not subject to the requirements of sections 202 or 205 of the UMRA.

This action is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. This proposed rule only applies to gasoline, diesel, and renewable fuel producers, importers, distributors and marketers and merely proposes the 2014 annual standards for the RFS program.

*E. Executive Order 13132: Federalism*

This action does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. This action proposes the 2014 annual standards for the RFS program and only applies to gasoline, diesel, and renewable fuel producers, importers, distributors and marketers. Thus, Executive Order 13132 does not apply to this rulemaking.

In the spirit of Executive Order 13132, and consistent with EPA policy to promote communications between EPA and State and local governments, EPA specifically solicits comment on this proposed rule from State and local officials.

*F. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments*

This proposed action does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 9, 2000). This proposed rule will be implemented at the Federal level and affects transportation fuel refiners, blenders, marketers, distributors, importers, exporters, and renewable fuel producers and importers. Tribal governments would be affected only to the extent they purchase and use regulated fuels. Thus, Executive Order 13175 does not apply to this action.

EPA specifically solicits additional comment on this proposed action from tribal officials.

*G. Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks*

EPA interprets EO 13045 (62 FR 19885, April 23, 1997) as applying only to those regulatory actions that concern health or safety risks, such that the analysis required under section 5-501 of the EO has the potential to influence the regulation. This proposed action is not subject to EO 13045 because it does not establish an environmental standard intended to mitigate health or safety risks and because it implements specific standards established by Congress in statutes (section 211(o) of the Clean Air Act).

*H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use*

This action is not a “significant energy action” as defined in Executive Order 13211, “Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use” (66 FR 28355 (May 22, 2001)) because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. This action simply proposes the annual standards for renewable fuel under the RFS program for 2014.

*I. National Technology Transfer and Advancement Act*

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (“NTTAA”), Public Law 104–113, 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This proposed rulemaking does not involve technical standards. Therefore, EPA is not considering the use of any voluntary consensus standards.

*J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*

Executive Order (EO) 12898 (59 FR 7629 (Feb. 16, 1994)) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

EPA has determined that this proposed rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it does not affect the level of protection provided to human health or the environment. This action does not relax the control measures on sources regulated by the RFS regulations and therefore will not cause emissions increases from these sources.



## **VIII. Statutory Authority**

Statutory authority for this action comes from section 211 of the Clean Air Act, 42 U.S.C. 7545. Additional support for the procedural and compliance related aspects of today's proposal, come from sections 114, 208, and 301(a) of the Clean Air Act, 42 U.S.C. sections 7414, 7542, and 7601(a).

### **List of Subjects in 40 CFR Part 80**

Environmental protection, Administrative practice and procedure, Air pollution control, Diesel fuel, Fuel additives, Gasoline, Imports, Oil imports, Petroleum, Renewable Fuel.

Dated: November 18, 2013.

Gina McCarthy,

Administrator.

For the reasons set forth in the preamble, 40 CFR part 80 is proposed to be amended as follows:

## **PART 80—REGULATION OF FUELS AND FUEL ADDITIVES**

1. The authority citation for part 80 continues to read as follows:

**Authority:** 42 U.S.C. 7414, 7542, 7545, and 7601(a).

2. Section 80.1405 is amended by adding paragraph (a)(5) to read as follows:

### **§ 80.1405 What are the Renewable Fuel Standards?**

(a) \* \* \*

(5) *Renewable Fuel Standards for 2014.*

- (i) The value of the cellulosic biofuel standard for 2014 shall be 0.010 percent.
- (ii) The value of the biomass-based diesel standard for 2014 shall be 1.16 percent.
- (iii) The value of the advanced biofuel standard for 2014 shall be 1.33 percent.
- (iv) The value of the renewable fuel standard for 2014 shall be 9.20 percent.

**[FR Doc. 2013-28155 Filed 11/27/2013 at 8:45 am; Publication Date: 11/29/2013]**